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Dr. PHILIP S. SMITH  
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# THE MINING CONGRESS JOURNAL

SEPTEMBER	CONTENTS	1916	
American Mining Congress convention . . . . .	393	Oil shales . . . . .	410
Apex law condemned . . . . .	394	Oil, in Colorado and Utah . . . . .	412
Arizona, copper production . . . . .	418	Oil, prices . . . . .	406
Ball, Max W. (cut) . . . . .	403	Oklahoma, spelter output . . . . .	401
Car supply . . . . .	421	Ore sampling . . . . .	402
Coal statistics . . . . .	391	Osage oil lands . . . . .	400
Coke, in U. S. in 1915 . . . . .	397	Phalen, W. C. (cut) . . . . .	405
Coke for heating . . . . .	392	Division of work . . . . .	400
Convention, Mining Congress . . . . .	393	Patents . . . . .	413
Copper tax . . . . .	387	Phosphoric acid . . . . .	395
Editorials . . . . .	407	Public land . . . . .	419
Revenue bill . . . . .	407	Rescue cars . . . . .	405
Mid-year statements . . . . .	408	Revenue bill . . . . .	387
Smokeless firing of coal . . . . .	408	Riter, Geo. W., dies . . . . .	392
Mr. Lane and Mr. Pinchot . . . . .	409	Rittman process . . . . .	405
Coal problems . . . . .	409	Rochester district . . . . .	422
Cooperation and statistics . . . . .	410	Russian Survey . . . . .	397
Compulsory arbitration . . . . .	410	Safety-first special . . . . .	400
Joplin . . . . .	411	Salt peter, price of . . . . .	423
Field meet in California . . . . .	418	Smith, Philip S. (cut) . . . . .	402
Field meets . . . . .	400	Spelter, in Oklahoma . . . . .	401
Fuel, for Government . . . . .	415	State geologists take trip . . . . .	399
Great Lakes, geological history of . . . . .	397	Steam shovels, in coal mining . . . . .	396
Labor shortage . . . . .	420	Sulphur . . . . .	397
Lignite . . . . .	404	Technical terms . . . . .	392
Lupton, C. T. (cut) . . . . .	399	Tungsten, foreign market for . . . . .	393
Manganese, buyers of . . . . .	416	Tungsten, prices . . . . .	398
Manning, Van H., made member Research Council . . . . .	400	Utah, Promontory district . . . . .	417
Matanuska coal . . . . .	412	Vanadium, in Peru . . . . .	400
Miners' circulars . . . . .	401	Vernadsky . . . . .	400
Nickel, in U. S. . . . .	402	Wyoming, foundry coke . . . . .	411

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# THE MINING CONGRESS JOURNAL

*Official Organ of the American Mining Congress*

## SENATE STRIKES OUT TAX ON COPPER; REFUSES TO RAISE MONEY FROM RAW MATERIALS

**Proposal to Raise Revenue from All Metals Entering into Manufacture of Munitions  
Meets Favor of Committee But is Stricken Out of Bill on Floor of Senate  
—House Expected to Recede in Conference.**

By eliminating the tax on copper from the revenue bill the Senate followed the course urged upon it by members from the metal producing states. At first the most favorable action expected was the reduction of tax on the one metal by making it apply to all metals entering into the manufacture of munitions of war but concerted action and clear reasoning finally secured the removal from the bill of any tax on raw materials.

There are some very ardent supporters of the copper tax idea in the House and there is certain to be a determined effort to restore it to the bill in conference. That such an effort will be futile is quite evident by the overwhelming sentiment in the Senate against placing a tax on raw materials and the divided support given the proposition in the House. The fact that cotton forms an important raw material entering into the manufacture of explosives aligns southern members with those from the metal producing states in their opposition to the original House bill or to the proposal to spread a tax over all the metals entering into the munitions trade.

### CHANGED IN SENATE

With regard to the tax on munitions the House Committee on Ways and Means said:

"Because of exceptional circumstances your committee is of the opinion that a special tax should be levied upon the manufacture of munitions, and that the same can be done without imposing an unjust or unreasonable burden."

In commenting on this feature of the bill the Senate Committee on Finance stated in its majority report:

"It is estimated that the bill as it came

from the House would raise \$197,000,000, and as amended by the Senate would raise \$205,000,000.

"This difference results largely from the reductions made in the bill as reported by your committee in changing the House method of taxing munitions, and the elimination of the copper tax provided for in the House bill, substituting therefor a 5 per cent profit tax upon materials entering into the manufacture of munitions, by adding certain additional classifications to the income tax and inheritance taxes as carried in the House bill.

"The House bill imposed a tax upon the manufacture of munitions, upon the basis of a graduated percentage of the gross receipts of all such persons and corporations. It also imposes a tax upon the gross receipts from the manufacture or sale of copper, brass, and other alloys, whether used in the manufacture of munitions or not. It did not provide for the payment of a tax by a subsidiary manufacturer or subcontractor. Your committee thought it just that subcontractors as well as contractors should pay whatever tax was imposed by this title.

"After due consideration your committee reached the conclusion that a net-profit tax would be a more just and equitable method of taxation than a gross-receipt tax, as proposed in the House bill. They have therefore amended the bill so as to provide for a tax to be levied upon the basis of net profits.

"Your committee also recommends that the bill be so amended as to eliminate the tax imposed upon copper, and as a substitute for that portion of the bill they recommend a tax upon corporations selling or manufacturing materials actually entering into and used in the manufacture of munitions as specified in the bill. Your committee be-

lieves that there should be a difference between the rate of tax imposed upon a finished munitions and upon the materials used and entering into its manufacture and they therefore recommend that the tax upon munitions be fixed at 10 per cent and that upon materials at 5 per cent of the net profits. Your committee further amends the House bill by confining this tax to corporations manufacturing munitions and corporations manufacturing or selling materials for use in the manufacture of munitions."

#### ALLOWANCE FOR DEPLETION

The provision of the bill allowing for depletion passed the Senate in the following form. The chances favor its acceptance by the House conferees:

Eighth. (a) In the case of oil and gas wells a reasonable allowance for actual reduction in flow and production to be ascertained not by the flush flow, but by the settled production or regular flow under rules and regulations to be prescribed by the Secretary of the Treasury; (b) in the case of mines a reasonable allowance for depletion thereof not to exceed the market value in the mine of the product thereof, which has been mined and sold during the year for which the return and computation are made; (c) and in the case of timber a reasonable allowance for stumpage not in excess of the market value of the standing timber actually sawed and sold during the year for which such return and computation are made: *Provided*, That no deduction shall be allowed for any amount paid out for new buildings, permanent improvements, or betterments, made to increase the value of any property or estate, and no deduction shall be made for any amount of expense of restoring property or making good the exhaustion thereof for which an allowance is or has been made.

#### THE HOUSE PROVISION

The provision in the House bill which included the tax on copper reads as follows:

Sec. 201. That every person manufacturing gun powder or other explosives shall pay for each taxable year an excise tax equivalent to the following percentages of the gross receipts during such year from the sale or disposition of such explosives manufactured in the United States, except blasting powder and dynamite:

Five per centum of the amount of such receipts not in excess of \$1,000,000, and

Eight per centum of the amount by which such receipts exceed \$1,000,000.

Every person manufacturing (a) cartridges, loaded or unloaded, caps or primers; or (b) projectiles, shells, or torpedoes of any kind, including shrapnel, loaded or unloaded or fuses; or (c) firearms of any kind, including small arms, cannons, machine guns, rifles, and bayonets, or (d) any parts of any of the articles mentioned in (a), (b), or (c), shall pay for each taxable year an excise tax equivalent to the following percentages of the gross receipts during such year from the sale or disposition of any such articles manufactured in the United States:

Two per centum of the amount of such receipts not in excess of \$250,000;

Three per centum of the amount by which such receipts exceed \$250,000 and do not exceed \$500,000;

Four per centum of the amount by which such receipts exceed \$500,000 and do not exceed \$1,000,000; and

Five per centum of the amount by which such receipts exceed \$1,000,000.

Every person smelting copper ore or copper concentrates, refining metallic copper, or alloying copper, shall pay for each taxable year an excise tax equivalent to the following percentages of the gross receipts during such year from the sale or disposition

of refined copper or copper alloys and from the sale or disposition of crude or unrefined copper if sold or disposed of for any purpose except for refining or alloying:

One per centum of the amount by which such receipts exceed \$25,000 and do not exceed \$1,000,000;

Two per centum of the amount by which such receipts exceed \$1,000,000 and do not exceed \$10,000,000; and

Three per centum of the amount by which such receipts exceed \$10,000,000.

#### CHANGED IN SENATE

This was changed by the Senate Committee to read as follows:

Sec. 41. (1) That every corporation manufacturing (a) gunpowder and other explosives; (b) cartridges, loaded and unloaded, caps or primers; (c) projectiles, shells, or torpedoes of any kind, including shrapnel, loaded or unloaded, or fuses, or complete rounds of ammunition; (d) firearms of any kind and appendages, including small arms, cannon, machine guns, rifles, and bayonets; (e) electric motor boats, submarine or submersible vessels or boats; (f) any part of any of the articles mentioned in (b), (c), (d), or (e); shall pay for each taxable year an excise tax of 10 per centum upon its entire net profits actually received or accrued for said year from the sale or disposition of such articles manufactured within the United States.

(2) And every corporation selling to or manufacturing for any corporation mentioned in paragraph (1) any material entering into and used as a component part in the manufacture of any of the articles enumerated in (a), (b), (c), (d), (e), or (f), shall pay for each taxable year an excise tax of 5 per centum upon its net profits actually received or accrued for said year from the sale or disposition of such material so entering into or used as a component part in the manufacture in the United States of the articles so enumerated as aforesaid.

#### ASHURST'S AMENDMENT CARRIED

On motion by Senator Ashurst, of Arizona, paragraph two was stricken out.

Senator Warren, of Wyoming, thinks the miners will have to pay the tax assessed against munitions anyway as he anticipates that means will be found whereby the tax can be shunted back onto the mine operators.

This view is not shared by the Democratic Senators from the metal producing states. They are very much pleased at the victory they won in the interest of the mining industry.

The only other important changes that were made in the paragraphs quoted above were: the exception of explosives and munitions used for industrial and sporting purposes and the addition of a proviso "That no such corporation shall be subjected to taxation upon net profits received during 1916 from the sale and delivery of articles under contract executed and solely performed prior to January 1, 1916.

#### OPPOSES UNEQUAL TAX

Senator Stone, of Missouri, chairman of the sub-committee handling the munitions schedule of the bill, spoke in part as follows in introducing the schedule:

"When the Underwood bill was pending before the Finance Committee and before the conference committee, whether right or wrong,

I took the position that lead and zinc were not treated in the metal schedule of the bill in a way that put those metals upon a basis of equality, as a matter of fair treatment, with other metals.

"My view at that time—and it still is my view—was that in making a tariff bill and fixing rates of duty on items in a schedule there should be, as far as practicable, a basis of fair dealing or equality—and equality is fair dealing—as to all the items in that schedule.

"If I thought, as I did think, that steel or other metals were given better treatment in the schedule than lead or zinc, I had a right to insist upon such adjustment of the rates as would eventuate in a nearer approach to what I considered substantial equality; and that is exactly what I did, and all I did.

"Here is what occurred so far as this bill is concerned. In this bill as it came to us from the House there was a tax levied upon copper and its products, but not in like manner on other similar metals. The subcommittee, made up of the Senator from New Jersey (Mr. Hughes), the Senator from Colorado (Mr. Thomas), and myself, all reside in States producing other metals of like kind and used for like purposes. There is no copper produced in the State of Missouri, and only in a small way, as I understand, in New Jersey, and comparatively in a small way in Colorado; but great quantities of zinc are produced in all three of these States, and great quantities of lead are produced in both Missouri and Colorado. There was not a dissenting voice in the subcommittee to the proposition that if copper was to be taxed in the bill, the other metals should go along with copper and bear the same burden. Lead and zinc were not in the bill as it came from the House. I did not try to keep them out, but, on the contrary, I insisted upon putting them in."

#### MYERS PROTESTS

Senator Myers, of Montana, vigorously opposed any tax on raw materials. Addressing the Senate he said:

"There should be no tax in this bill on raw material unless all raw materials which are now and have been for some time enjoying an unusual degree of prosperity are taxed all alike. I do not believe it is just to single out a product of the metal-producing States and put a tax on metals when there are many other raw products enjoying just as great or greater prosperity which go untaxed.

"A tax on metals is peculiarly a tax on development, industry, and exploration of the western country. It strikes with peculiar force the far Western States—the metal-producing States of the Union. It would have very much of a tendency to discourage prospectors from going out and discovering new bodies of ore, and getting capital for their development, and opening up new mines for the benefit of the entire country. It would have a very strong tendency to discourage the op-

eration and development of many small mines which have scarcely reached the productive point or have no more than reached that point. It would be very strongly resented by the people of the mining States. The mining business is a hazardous business. It is extremely sensitive, and capital and labor are very easily turned away from it.

"As far as copper is concerned, copper is and has been for a great many years on the free list. It enjoys no protection; probably it is in no particular need of any. At least, it is not asking for any. We are not asking any for it. I think for forty years or more copper has been on the free list; and yet there is a great deal of copper produced in Mexico in normal times, and some of it is shipped into this country and competes with the products of our own copper mines. We ask no protection on copper. I would be the last person in this body to ask for that; but when it is on the free list, and has to compete with the copper mines of Mexico, where labor is cheaper than here, to say that its production should be penalized by having the heavy hand of a tax laid upon it, and laid upon all copper produced in this country, I think, under the circumstances, would be unreasonable and unfair. Only recently has copper been enjoying some prosperity. Eighteen months ago copper was being produced in Montana at a loss, or was barely paying the cost of production.

"Under the present tariff law the duty on lead and zinc is very much reduced, as compared with what it was a few years ago. We are not making any complaint of that. We are satisfied. But to go further and lay the heavy hand of a penalty in the way of a tax on producing those metals in this country, I think, would be unfair; especially unfair to that group of States which constitute the metal-producing States of the Union, and which contribute in that line of production very largely to the common welfare and prosperity of all the States in the country."

#### PENROSE REPLIES

Senator Myers' observations brought forth a sharp rejoinder from Senator Penrose, of Pennsylvania. He said:

"I can appreciate the gladness of the Senator from Montana (Mr. Myers) in having this paragraph stricken from the bill. The majority—and he belongs to it—went merrily along so long as direct taxation was confined to individuals and corporations largely in New York, Pennsylvania, and half a dozen Northern States; and the tax on munitions was all right from his point of view as long as it was confined to the higher manufactures chiefly located in Connecticut or in Pennsylvania. But the very moment direct taxes were imposed upon the component parts of munitions, which affected copper and zinc in his own State, and zinc and lead in Missouri, and cotton in the Southern States, we find that their heroic stand for raising revenue fades away, and the spasm of virtue which they had

in their caucus, when they inserted this paragraph, disappears here on the floor of the Senate."

#### AS TO OIL WELLS

An interesting discussion having a bearing on the method of taxation as applied to oil wells and coal and metal mines was precipitated when Senator Phelan, of California, read the following telegram from the Independent Oil Producers' Agency, which is made up of 176 companies:

The committee amendment, Senate Calendar No. 722, H. R. 16763, fixes deduction for depletion of oil wells as a reasonable allowance for actual reduction in settled production. This will deny depletion to all oil-producing companies that maintain their production by new developments and new capital. We beg of you to use every effort immediately to secure for oil companies depletion on same basis as proposed for mines, being a reasonable amount annually, not to exceed the market value of oil in the ground, of the product which has been brought to the surface. Present amendment causes oil producers to pay tax on capital and not upon income. All oil producers in California deeply interested.

Commenting on the message, Senator Phelan said:

"If it is true that it forces producers to pay taxes on capital and not upon income, I am sure the committee will meet the objection. As I understand, it seems that an income tax is charged upon the production value of the product, to be ascertained not by the flush flow but by the settled production or regular flow. These gentlemen, in order to meet the constant diminution of their product sink new wells and invest new capital so that when the collector comes around there will be no deduction whatever for depletion, because they have made it good by the investment of new capital. I should like to submit that to the committee, and ask that immediate action be not taken until a little later, in order that it may be studied. As I have said, the telegram has just been received."

#### WILLIAMS EXPLAINS

Senator Williams, of Mississippi, in charge of the bill, said, in reply:

"In answer to what was said by the Senator from California, the committee does not think that this will result in taxing any part of the capital as income. Of course, we had to fix a rule, and the rule cannot work with mathematical precision in the case of things which differ so much from one another as oil wells do. Under the present law, Mr. President, they are allowed to deduct only 5 per cent of the gross value of the product in the place of output. We thought that that deduction was too little and that there ought to be a deduction more equitable in its character.

"There has been no part of the bill which has been more anxiously studied and which presented more difficulties than this part of it. After consulting those in the Senate who were most familiar with the operation of oil wells we finally adopted this provision, which was presented by the Senator from West Virginia (Mr. Chilton), who is thoroughly acquainted with the business. On the one side was the House bill and the present law, which allowed a deduction of only 5 per cent. Upon the other side was the danger that a deduction of the entire flush product of the well might be made, and as a consequence no taxes paid at all.

"If the Senator will notice the bill, he will see that we have adopted a different rule for metallic mines and for coal mines, for the very reason that I have stated. The Senate committee undertook to try to fix a rule that would be just in each case. Of course you can tell the value of the coal in the ground, because coal is coal; but you cannot tell the value of copper in the ground, nor the value of gold, nor the value of silver, because the ore when it comes out is neither gold nor silver nor copper; it is mixed with various other things. So we kept the old 5 per cent provision with regard to them, and then we made a new rule as to gas and oil, and then we made a new rule as to coal, and then we changed the rule with regard to metallic mines by hedging it around so that the department could not, by ruling, do what it has done."

Senator Phelan then asked:

"Do I understand, then, that there is no rule, and that the department is to ascertain the value of copper and gold and silver buried in the ground in order to determine the amount of income tax?"

#### POINTS OUT DIFFERENCE

Senator Thomas, of Colorado, answered the query as follows:

"The only difference is a difference of process. The assay determines the metalliferous contents of metallic ore, while, of course, coal is a commodity all of which in the vein is a commercial product. It is therefore merely a difference in the method of ascertaining the value. The output of a copper mine or of a lead mine for 12 months yields certain metalliferous contents, and the value in the mine of these contents is thus easily ascertainable. I will say to the Senator from California that the principle is one which occurs very commonly in his state and mine as a result of trespasses by one mine owner upon the property of another, sometimes willful and sometimes unintentional. Where it is unintentional the damages are based upon the value of the ore in the mine; and that is ascertainable, as I say, by assaying the contents and ascertaining them by chemical analysis. It is a perfectly simple and perfectly easy method of procedure."

Senator Chilton, of West Virginia, who is

well informed with respect to the oil industry, made this explanation:

"The old law, making a deduction of not exceeding 5 per cent, after it was explained to the committee, of course, struck the committee as being absolutely an arbitrary one, and based upon no reason. Therefore, in establishing a rule for these deductions, they reasoned in this way: Suppose you were to fix the value of the production of a well for the purpose of fixing its income. You would not do that by the flush flow; that is, the first flow of the well, when it is producing largely. You would want to get at the settled flow of the well. Then it seemed to us that if you wanted to make a deduction, the honest and straightforward rule would be to make the deduction upon the same basis; and this is, in my judgment, as nearly a fair rule as it is possible to get.

"The oil and gas producers do not want anything unfair. They want only the actual depletion. This they failed to get under the old law, and they will get it under this amendment. The amendment as reported by the committee was the result of many conferences; it is fair; I have given my assent to it in conference and know that it is much nearer a just rule than the one which it supersedes. I hope it will not be changed.

"In the case of mines it is 'a reasonable allowance for depletion thereof'—that is, for the depletion of the mine—not to exceed the market value in the mine of the product thereof which has been mined and sold during the year for which the return and computation are made.' Now, that is absolutely fair. No matter what it is, whether it is a coal mine or a copper mine or a silver mine. What we are trying to do is to ascertain the exact value of the depletion of the mine. What has been put upon the product in the way of labor or refining processes should not be estimated, but the value of what is taken out when in the mine; and that is perfectly fair, no matter what it may be, whether it is silver, gold, copper, or coal.

"There is no such thing as developing an oil well without drilling the well and putting in capital and labor and time upon it, and these terms here mean this: When you first drill in an oil well it has a flush flow. It has gas behind it; it has a head pressure, so to speak; and the flow is larger at the beginning than it will ever be thereafter. It gradually goes down. What we want to do is to find an average, find what is right, find what it has been depleted during the year. This rule is that you must take it, not by the flush flow, but by the settled flow. When the head pressure, as they call it, goes off, there is a settled production, and we take a reasonable amount, based upon the settled flow of the well during the year. I think that is fair."

#### APPLIES TO ALL MINES

Senator Shafrroth, of Colorado, made the following statement:

"The committee have made the rule applicable to coal mines, giving them the right to a reasonable allowance for depletion, not to exceed the market value in the mine of the production thereof, but had made a different rule as to metalliferous mines, namely, the rule of reasonable allowance, not to exceed 5 per cent of the gross value at the mine of the output for the year. Now, that is a very indefinite thing. It is only for one year—5 per cent for one year—whereas, if we are entitled to anything, we are entitled to the value in the mine of the ore taken out that year. When the attention of the caucus was called to it, they readily conceded that that part of it should apply to the entire provision, the reasonable value, the same as in coal mines. Consequently we struck out the word 'coal' and made it 'mines,' so that it would be applicable to all mines, for it can be ascertained just as readily in the case of metalliferous mines as in the case of coal mines.

"As to the oil provision, Mr. Chilton, who knows a great deal about this subject, wrote the amendment himself, explained it, and it was adopted; and I think it is a good provision."

#### GEOLOGICAL SURVEY BEGINS ISSUANCE OF NEW STATISTICS

In sending out the first monthly statement issued by the Geological Survey relative to coal production in the United States, Geo. Otis Smith believes that the Survey is furnishing the railroads and the coal industry, as well as the general public, information that is timely and valuable. "It is well recognized," says the director of the Geological Survey "that the rate of production of coal, like that of pig iron, is an important index of general industrial conditions, the trend of which is being keenly watched today by all men of affairs. The statements are intended to furnish a basis for comparison of the fluctuations in coal shipments from month to month.

"The coal industry is of such proportions that complete and accurate official statistics of production can be obtained but once a year, and even then require at least six months for collection and compilation. The need for prompt, even though approximate data, led the Survey, a year ago, to begin the collection from railroads of statements covering the carloads of bituminous coal and of beehive coke originating monthly in the coal fields. More than 100 roads, reaching the coal fields in every State and originating more than 90 per cent of the rail shipments of bituminous coal, are now cooperating in this work."

The statement referred to in the foregoing is as follows:

	July, 1916	June, 1916	July, 1915
Carloads of bi- tuminous coal	376,775	380,041	364,396
Carloads of bee- hive coke . . .	47,569	50,102	46,110

### TECHNICAL TERMS OFTENTIMES NECESSARY TO EXPLANATION

The use of technical words and phrases is a subject of increasing discussion. "Technical" is used to describe those words and expressions which belong to some particular profession or trade. Often miners and prospectors speak of technical words as if they were used only by professional men or scientists who wish to write above the ordinary reader. As a matter of fact, all trades and callings necessarily have a great many words which apply only to their work and are therefore technical. The simpler the subject or the more superficially it is treated the fewer are the technical terms but the most ordinary occupations have them. For instance very few farmers "list" corn and "drill" wheat, but those who really study their soils, fertilizers and the plants they raise add a great number of new words to their vocabulary, Frank L. Hess, of the U. S. Geological Survey, points out.

Mining is a calling which deals with subjects unfamiliar to the majority of people, Mr. Hess says, and has developed a large number of technical words. Many of the terms in common use among miners and prospectors are wholly foreign to persons not acquainted with mining. Such words as moil, stope, winze, drift, adit, gouge, singlejack, shoes, dies, etc., mean little or nothing to most persons not familiar with the working of mineral deposits. The jokes told in every mining camp at the expense of the newcomer who is mystified about "horses" in the veins need only be mentioned to make this statement apparent to every man who has had anything to do with a metal mine.

Technical words are necessary to express definite ideas and have the advantage of a specific meaning and usually only one meaning, making it much easier to write exactly with than without them and saving time and effort in writing and expression. To appreciate this, it is only necessary to attempt to describe the objects mentioned "in common language" intelligible to a person unacquainted with mines, for instance, who knows nothing of mines or mining. As the knowledge of ore deposits grows many terms which only a short time ago were considered the special property of the professional geologist or mining engineer are becoming common. Such words as rhyolite, dacite, diorite, ferberite, hubnerite, scheelite, alunite, and the chemical symbols for the rare and heretofore little-known minerals, all of which were, until the last few years, considered too technical for the ordinary man of the camp, have become or are fast becoming common property of all miners and prospectors.

Most of the easily discovered deposits of the precious metals in this country have been found. That the prospector is making himself familiar, through the reading of the technical periodicals, reports of the State and national governments and the study of text books, with many of the less common phenomena of ore deposits and general geology, and necessarily with the terms in which they are expressed, is shown by numerous letters received by the Geological Survey.

### Treats of Mine Ventilation

*Mine Ventilation* is a new bulletin issued by the Jeffrey Manufacturing Company of Columbus, Ohio.

This bulletin illustrates and describes a line of Stepped Multi-Bladed Wheel Type, Centrifugal "Boosters," Propeller Fans, and also small Blower Fans for ventilating entries. It also contains ventilating formulae for Jeffrey Fans, and Tables compiled to give the mine superintendent, mine manager or those interested in this line of work, a comprehensive idea of the results to be obtained from various sizes of Jeffrey Stepped Multi-Bladed Fans.

Copies of this book may be obtained free of charge by writing to the Jeffrey Manufacturing Co., 958 North Fourth Street, Columbus, Ohio, or to any of the following branch offices: New York, Boston, Philadelphia, Pittsburgh, Scranton, Charleston, W. Va.; Chicago, St. Louis, Birmingham, Dallas, Milwaukee, Denver, Seattle, Montreal.

### Geo. W. Riter Claimed By Death

George W. Riter, a well-known mining engineer of Utah and a member of the American Mining Congress for many years, died of apoplexy at Salt Lake, August 20.

Mr. Riter was born in Salt Lake City, February 22, 1870. He attended the University of Utah and was graduated from the engineering course of Stanford University in 1896. For many years thereafter he was secretary and general manager of the Eureka Hill Mining Company. He was city engineer of Salt Lake City in 1904-1906, and three years ago appeared before the Ways and Means Committee at Washington as a representative of the Utah mining interests in connection with the preparation of the tariff on metals. Mr. Riter was an officer of the Utah Chapter of the American Institute of Mining Engineers at the time of his death, and was a frequent contributor to the mining journals.

### COKE BECOMING MORE POPULAR FOR HEATING

Nearly 2,000,000 tons of coke from beehive and by-product ovens were used in 1915 for heating purposes, mainly domestic. For heating, particularly in household furnaces, it possesses many advantages and is said to be coming rapidly into favor. In a general way it has the composition and heating value of anthracite, having the advantage of not clinkering and of igniting more easily, according to the Geological Survey.

The use of raw bituminous coal for heating is wasteful in that the ammonia, tar and benzol are lost without a compensating return in heating value, and the increased use of coke from by-product ovens as domestic fuel is encouraging to all who desire the fullest and best use of our natural resources, Survey specialists declare.

## MINING CONGRESS CONVENTION PROMISES TO BE AN UNPARALLELED SUCCESS

By Calling Coal Operators from Fourteen States, Governor Dunne, of Illinois, Has Given Additional Interest to the Gathering Which Will Be Held in Chicago  
Nov. 13-16—Extensive Exhibit of Machinery and Supplies to Be Shown

Additional impetus will be given to the nineteenth annual convention of the American Mining Congress, which is to be held in Chicago November 13 to 16, inclusive, by the action of Edward R. Dunne, Governor of Illinois, in calling a special meeting of delegates from the fourteen coal mining states to meet in Chicago in association with the American Mining Congress Convention. Governor Dunne called the meeting in order that consideration might be given in the matter of uniformity in laws controlling coal mining operations. It is expected that a recommendation in this regard will be made. J. G. Grossberg, of Chicago, is in immediate charge of the work for Governor Dunne.

The preliminary work for the convention is progressing rapidly in spite of the vacation season. Very much has been done to insure the success of the meeting.

Campaigns have been inaugurated to bring together thinking men from every branch of the mining industry. Assurance is at hand of the attendance of large delegations from the precious metal mining states, the lead and zinc districts, the copper country, the iron and steel mines. As Chicago is headquarters for a large part of the coal output of the middle West, that industry will be well represented.

The entire 17th floor of the Hotel LaSalle is to be given over to exhibit rooms for the mining machinery and supply houses of the country. This space is being taken very rapidly. The demand is certain to be larger than the supply.

The Chicago committees are comprised of real hustlers. They are enthusiastic in their desire to make this meeting a big credit to Chicago. Present indications are that their fullest expectations are to be realized.

James F. Callbreath, secretary of the Mining Congress, will leave early in the month for a trip through the copper and iron country of Michigan, with director of the Bureau of Mines, Mr. Manning, and State Geologist R. C. Allen, of Michigan. It is planned to hold meetings in the various camps, and secure the cooperation of this state in making the convention a success.

Later in the month Mr. Callbreath will leave for a trip to Colorado and Utah, where various meetings are being arranged. It is hoped that every mining man in those states will arrange to attend these meetings. Definite plans for the betterment of every branch of the industry will be formulated.

The Ohio operators are joining heartily in the work looking to the success of the convention. Indications of genuine interest, and earnest cooperation, which give hopes of unusual success, are coming from all parts of the country.

One of the features of the work of the Mining Congress in connection with the convention is a special edition of the MINING CONGRESS JOURNAL. This number will be three times the size of the regular issue and will be filled from cover to cover with news matter of the most important interest to the mining industry.

Two illustrated lectures will open the entertainment feature of the convention. One of these lectures will be by Dr. Henry Mace Payne, of New York. It will deal with mining in the Arctic regions of Alaska and Siberia. The slides which will be used in this lecture will portray features of mining in the far North which never before have been shown.

The other lecture will be by Edward L. Doheny, of Los Angeles, and will be accompanied by moving pictures showing the Cerro Azul gusher in Mexico. Mr. Doheny was a pioneer in developing the great Mexican oil fields in the Tampico region.

### GREAT BRITAIN IS ONLY FOREIGN MARKET OPEN FOR TUNGSTEN

The principal buyers of tungsten ore are very much less than fifty, although there are numerous brokers.

Practically the only foreign market for tungsten open to persons in the United States is that of Great Britain. It is understood that all tungsten ores in Great Britain are under the control of the government and they are sold at the uniform price of 55 shillings per unit of a long ton, that is 55 shillings for 22.4 pounds of tungsten trioxide,  $WO_3$ . George T. Holloway, 13 Emmett Street, Limehouse, London, England, probably would furnish a good connection between seller and government.

Shipped from Alaska concentrates will undoubtedly sell to better advantage than ore unless the ore contains more than 60 per cent  $WO_3$ .

The demand is lessening and the prices are dropping. Fifteen dollars is probably the top price (per unit). The unit in the United States is 1 per cent of a short ton in tungsten trioxide, that is 20 pounds  $WO_3$ .

**REPEAL APEX LAW; STOP  
LEASING IDEA, SAYS LEEHEY**

Repeal of the Apex law is essential to the best interests of the mining industry, Maurice D. Leehey, of Seattle, thinks. In a letter to the Mining Congress he says:

"The statement of Jesse Knight of Provo, Utah, as quoted in the MINING CONGRESS JOURNAL, expresses my ideas on the proposed Federal mining legislation much better than I could do so myself.

"I am satisfied that any commission to revise the mining laws would be used as a means of advancing the leasing idea and its application to the metallic minerals. Certainly, it would be used to advance legislation which would limit the present power of the State legislatures and increase the power of the bureaus at Washington. That much is evident in the suggestions already advanced. The prospectors and small operators are not prepared to make use of the publicity that would be provided by such a commission, but the so-called conservationists are, and will do so at government expense.

"Then, too, experience has shown that such dreams of ideal legislation are never realized. Even if the commission framed a good bill, it would simply provoke endless debate, and would be so mutilated by Congress that its authors could not recognize it by the time it became a law.

"Let the efforts of mining men be directed toward certain specific amendments, more particularly the repeal of the law of the apex. Do nothing that will impair the present power of the local legislature to provide for the particular local needs of each State or territory. Do not try to frame a uniform law for the arid regions of the southwest, the rainy, fog-swept islands of the Alaska coast, and the Arctic conditions of the Yukon interior.

**SATISFIED IN ALASKA**

"We are well satisfied in Alaska with the present law relating to the location of mining claims and the mining of metallic minerals. I refer especially to the supplemental legislation by the territorial legislature. Alaska contains perhaps 75 per cent of the unappropriated public mineral lands which will be affected by any such legislation. I am satisfied that the mining men of Alaska would rather adhere to the present law than to take chances upon any general revision, especially a revision inevitably conducted in such a way as to give the theorist reformers of the East and Middle-West, and other ultra-conservation idealists, the best possible opportunity at government expense to air their theories among the great mass of people of this country who know nothing about the subject, but who are impressed with the idea that millions of valuable property are being recklessly exploited. This sentiment controlled our public land administration for several years to the great detriment of the western States and to the utter stagnation of Alaska development."

In replying to this letter the Secretary of the Mining Congress said:

**COMMISSION ONLY HOPE**

"If we are unable to convince a commission of fair-minded men after they have been accessible to mining men in the various centers of the West that we need a revision of the mining laws, it seems to me that the situation is hopeless. I doubt whether any bill can be passed unless it has been given special endorsement in such a way as to make it more or less immune to ignorant amendments. For instance, I do not believe the Alaskan Railway Bill would ever have been passed without the impetus given it by the investigating commission.

"The one feature against which more men unite than any other is that in the present law providing for extraterritorial rights. As your letter states, the people of Alaska are entirely satisfied with that provision. Personally I very greatly doubt the wisdom of its repeal at this time, first, because I believe that questions arising under it have been pretty generally adjudicated; second, the apex law has been charged with the responsibility of a much greater part of mining litigation than it is responsible for (see page 363, August issue, MINING CONGRESS JOURNAL); third, I have been almost convinced by a paper which is in preparation for the next convention of the Mining Congress, by Philip Van Waganen of Denver, that the Apex law is the father of the prospector, and that without the apex the prospector would become entirely a thing of the past. Mr. Van Waganen will show in this paper that the prospector does not exist anywhere in the world except under extraterritorial right law, and unless he may have a fee simple title to his discovery. To ask Congress to amend the mining law without the aid of a commission means beyond question the abolition of the Apex law.

"In further comment upon your statement that the Alaskans are satisfied with the present law: Are they satisfied, and will they be satisfied with the present law as it applies to deposits of oil, and those deposits which are of non-metallic minerals not found in veins and lodes?

"I am sure we are in accord with the general result desired, and I am also sure that you will agree with me that to make a mining law the football of a bunch of men among whom are some willing to introduce a bill like the one now before the House, providing that the government shall lease its coal lands on the basis of \$50 per acre per year for each foot of thickness of coal therein, and its oil lands at \$10 per day for each acre not kept producing at its normal capacity, would be a dangerous proposition.

"My own personal belief is that unless we are able to educate and convince a commission of what should be done, we had better leave the mining law alone."

**Much Demand for Bowie's Paper**

Great interest is being manifested in technical paper 161 published by the Bureau of Mines. In this publication C. P. Bowie describes, in popular language, the general principles involved in the Rittman process of making gasoline.

## WESTERN STATES SHOULD PRODUCE GREAT QUANTITIES OF PHOSPHORIC ACID

Immense Amounts of Sulphuric Acid Available in the Vicinity of Great Beds of Phosphate Rocks Cause Fertilizer Makers to Turn to Western Sources of Supply—Much High-Grade Rock Exported

By W. C. Phalen

The important phosphate deposits of the United States are located in Florida, Tennessee, South Carolina, Kentucky, and Arkansas in the East, and in Montana, Idaho, Wyoming, and Utah in the West.

Since the beginning of phosphate rock mining in the United States, there has been a total marketed output of 48,457,906 long tons, more than half of which has been produced in the past 10 years. During this 10-year period there has been an exportation of nearly 11,000,000 tons, or about 43 per cent of the marketed production in the same period. The exported material does not represent average grades, but the highest grade, running 77 per cent and more in phosphate of lime and 3 per cent or less in iron oxide and alumina.

### PRESENT METHODS WASTEFUL

The bulk of this exportation is from Florida for obvious reasons. It is plain that the deposits in this state, more particularly, are being wastefully depleted under a system of selecting the cream of the product for export to Europe, leaving the comparatively low grade rock, running from 65 to 70 per cent and under in bone phosphate of lime for our own fertilizer manufacturers to work up after all the best rock is gone, says W. C. Phalen, of the U. S. Geological Survey.

Economical methods of production and hence of conservation are now employed in the phosphate fields of Tennessee, which should serve as a type for all fields. These ought to prove of educational value to American agriculturists and fertilizer manufacturers, and should result in a demand for the highest grade rock, both for direct application to the soil and for use in making acid phosphate. It is certainly evident that the European manufacturer is alive to the situation and is demanding the highest grade Pacific Island and Florida rock. The cost of transporting low-grade rock and the acid phosphate resulting from it is another factor which should appeal to the self-interest, if to no other motive, of the American consumer. This factor, as well as the important one of keeping our high-grade rock at home, is the fundamental reason for a change in our policy with reference to our high-grade phosphate, declares Mr. Phalen. Continuing, he says:

### METHODS OF CONSERVATION

In the early days of phosphate mining in the more important phosphate fields of the United States there was a large waste of good material. In many places this waste is still going on. In certain localities, speaking more particularly of the Tennessee brown rock field, the material once thrown aside is in such condition that it may be reworked and is actually being reworked. In other places it is lost beyond all hope of recovery. The devising of methods to prevent or reduce such loss and yet maintain the grades set by commercial standards is one of the problems that has faced and is now facing the phosphate rock miner. Fortunately it is in process of being worked out and the Tennessee field is a conspicuous example of progress in this respect.

There is going on in the Mount Pleasant, Tenn., phosphate field, and without doubt in other parts of Tennessee and to a certain extent in other fields, changes that will result in leaving very little good phosphate rock in the ground. Some phosphate is going into the waste ponds, but the time will, without doubt, come when all this material will be reworked, and even now some companies are reworking or planning to rework the old tailings. Modern mining and milling methods are revolutionizing the industry and incidentally conserving this valuable fertilizer material. They are in striking contrast with the wasteful and crude methods formerly employed in the brown phosphate rock field. When phosphate rock was first mined in the Mount Pleasant, Tenn., region, it is safe to say that at least half of the good material, such as is now being worked, was thrown away. A great deal of this cannot, in the nature of things, be recovered, for, in the course of time, it has become thoroughly mixed with clay and in places is so covered up with overburden as to make it impossible to work it at a profit. The large operators are using up-to-date methods, but even now some of the small operators are employing the old-fashioned hand methods, which in the past resulted in the loss of much valuable rock.

### CHEMICAL METHODS

There is associated with all the large important phosphate rock deposits considerable

rock that is not up to the present commercial requirements in content of calcium phosphate. There is also being produced in connection with the preparation of commercial phosphate rock for market a great deal of low-grade material. To bring this class of material up to commercial grade, or to a content of 70 per cent or more of calcium phosphate, various chemical methods have been used. The time will undoubtedly come when these chemical methods will have much more extended application than at present and there will result the conservation of a great deal of phosphate rock now consigned to the waste ponds. Such methods are of more than ordinary interest and are suggested in connection with the western field, owing to the long distances that phosphate rock has now to be transported from this field before it reaches the market. The immense quantities of sulphuric acid potentially available in the immediate vicinity of the western phosphate rock deposits, which should become available in increasing quantity as time goes on, is another important element in the situation. The chemical method of concentrating phosphate to the form of phosphoric acid, superphosphate, or double acid phosphate, and thus enabling it to be transported long distances will probably be worked out in the western field, but, wherever it is worked out, it will be the means of conserving not only the enormous amount of low-grade rock in the Western States, but a large quantity of low-grade rock in the eastern field.

#### SUBSTITUTES FOR PHOSPHATE ROCK

The use of substitutes for phosphate rock has been in the past of great importance, but since the discovery of large deposits of high-grade rock the price of phosphatic fertilizer has greatly decreased, as a result of which the more highly priced guanos and other phosphate-bearing materials have been driven out of the market. There is still, however, much low and medium-grade material which could, if necessary, actually take the place of phosphate rock as a source of phosphorus and which probably will be used at some future time with changed commercial conditions.

The different substitutes for phosphate rock that have been suggested are as follows: Under the natural substitutes come (1) phosphatic limestone, (2) phosphatic minerals, like apatite, nelsonite, wavellite, (3) guano, (4) marl, (5) excrement, (6) bones, and under the class of artificial substitutes may be included (1) basic slags, and (2) manufactured compounds, such as ammonium phosphate.

#### PHOSPHATE RESERVES

Though the total phosphate reserves in the United States, are very large and will probably last several generations, it must not be accepted as a truism that our desposits are inexhaustible. On the other hand, at the present rate of production, which without doubt will increase as time

goes on, these deposits, especially the high-grade deposits, cannot be expected to last indefinitely.

The United States is now producing for domestic use and export about 3,000,000 tons annually. More than 99 per cent of this comes from the Eastern States, and in 1914 nearly 80 per cent came from Florida. On this basis eastern phosphates should last fully 100 years, taking into account material of good grade.

#### AVAILABLE FOREIGN RESERVES

From recent available data it is evident that the foreign reserves of phosphate are very large, but apparently they are not so large as those within the United States. It must be considered, however, that the North African phosphate field, which is thought to extend eastward across Arabia into Persia, has not been explored sufficiently to enable us to know even approximately what its real magnitude is. The Algerian deposits are apparently low grade, but their tonnage runs up into hundreds of millions. The high-grade rock of the South Sea Islands, which naturally will be worked first, are estimated at approximately 70,000,000 tons.

#### STEAM SHOVELS BEING USED EXTENSIVELY IN COAL MINING

Remarkable progress has been made in recent years in the use of steam shovels in mining bituminous coal, according to C. E. Lesher of the Geological Survey. In the coal fields in some of the western and middle-western States there are areas along the outcrop of the flat-lying beds where the cover is insufficient to permit underground mining. For many years sporadic attempts were made to recover this coal by removing the cover with teams and scrapers, but that method is expensive and efforts of that nature have never been of great importation. The modern steam shovel, however, furnished a means of recovering this coal on a large scale and as experience has accumulated, the size of the shovels and of the operations have increased until now it has ceased to be merely a matter of interest, and is in fact a sizable branch of the coal mining industry.

In a recent paper before the American Institute of Mining Engineers, J. B. Warriner states that the earliest mining on a commercial scale in the anthracite region was a stripping operation. This was the famous Quarry mine at Summit Hill, and "cattle and scrapers" were used to remove the dirt and coal. This work appears to have been done prior to 1821. Mr. Warriner states that the first steam-shovel was used in the anthracite region in 1881. It weighed 30 to 35 tons and had a dipper capacity of one yard. Even today the shovels used there are smaller than those in the bituminous regions, but this is because of the different nature of the work to be performed and the conditions under which the beds occur.

## COKE-MAKING IN UNITED STATES HAS ITS MOST IMPORTANT YEAR IN 1915

Necessity for General Use of By-product Oven Is Made Clear by Conditions Arising From War—Public Demands Development of Domestic Dyestuffs Industry—Important Also as Preparedness Measure

The year 1915 was without doubt one of the most important in the history of coke making in the United States, not so much because of the quantity and value of the product, but because of the awakening not only of the public at large but also of the makers and users of coke to the fact that this country has been the most backward of all great nations in the saving and utilization of the by-products to be obtained in distilling coal. The economic effects of the European conflict have forced upon the American people in a manner at once startling and effective, the knowledge of this country's dependence upon Europe and upon Germany in particular for dyestuffs. The realization of the importance of these materials has been brought home to all by the publicity given the matter, and by the scarcity in the stores of the usual profuse assortment of dyed goods. Public interest is growing, in having in this country a dye industry as a measure of industrial preparedness in time of peace, convertible into an explosives industry and therefore serving for military preparedness in time of war.

These are conclusions of C. E. Lesher, coal and coke statistician of the Geological Survey after a study of the year's figures.

Coke ovens of the retort type supply the raw materials from which dyes and explosives are made, and interest centers upon the progress made in recent years in building up this industry. Since 1893 when the first ovens were built in the United States, there has been a steady increase in the use of the by-product process in manufacturing coke. It was not until 1915, with the advent of the war contracts for benzol, and the dye situation, that those engaged in making and using coke came to a full realization of the wastefulness of the old process. They now recognize that the day of the beehive oven is passing and that the future holds much of promise for the manufacturer of by-product coke, Mr. Lesher believes.

### SULPHUR NOT ADDING TO NEWS PRINT PAPER COST

In the controversy which has arisen between the publishers of the country and the manufacturers of newsprint paper it is pointed out that sulphur, one of the important raw materials used at the sulphite mills, is contributing no part to the increased cost. Contracts of sulphur are being filled at these mills at the same price this year as has been the case for a number of years.

### GEOLOGICAL HISTORY OF GREAT LAKES SET FORTH IN BRIEF

It is supposed that the depressions occupied by the Great Lakes were originally river valleys. During the glacial period great lobes of the continental ice sheet moved along these valleys and doubtless scoured them out, deepening them and broadening them. When the climate became warmer the fronts of these great glacial lobes were melted backward toward the north and northeast and as the outlets of the lake basins were in these directions, these outlets were blocked by ice while considerable bodies of water accumulated in the upper parts of the basins. There were thus formed a series of great glacial lakes. The water rose in each basin until it reached a low place in the surrounding higher land and found an outlet to the Mississippi River or elsewhere. With the gradual recession of the ice front and the opening of new and lower outlets, and still later with changes in the elevation of the land toward the northeast, a whole series of lakes came into existence one after another, having different elevations and different points of discharge. This part of the history of the Great Lakes is quite complex, according to the Geological Survey. It has been described in numerous publications, one of which is an exhaustive paper entitled "The Pleistocene of Indiana and Michigan," published as Monograph 53 of the Survey. It is for sale for \$1.50.

When the St. Lawrence valley became cleared of ice and the land in the northern part of the country reached its present elevation the lakes assumed their present proportions. The outlet then came to be by way of the St. Lawrence River, discharging over the cliff between Lake Ontario and Lake Erie and starting the cutting back of Niagara Falls. A brief outline of this history has been published by the Smithsonian Institution, from the Smithsonian Report for 1912, Publication 2201, The glacial and postglacial lakes of the Great Lakes region.

### RUSSIAN SURVEY KEEPS ON WORKING DESPITE WAR

Despite the war the geological publications of Russia are continuing to be distributed. A publication of great value just has been received in this country dealing with the geology of the phosphate deposits of the Russian empire. It is by J. Samojloff.

### TUNGSTEN PRICES EXPECTED TO FALL TO ANTE-BELLUM LEVEL

Tungsten prices have been falling and in response to inquiries for the reasons the following statement has been prepared by Frank L. Hess of the United States Geological Survey.

To obtain the best basis for drawing conclusions the world's production should be shown, but the figures for 1914 and 1915 are only in part available, for the war has so disturbed many countries that few statistics have been published. Reports from Burma show that a considerable increase in production was made in that country in 1915, and travelers from South America have reported to the Survey that the West Coast countries have had a boom in tungsten mining comparable to that in the United States.

In the United States itself the production in 1915 was 2,165 short tons of 60 per cent concentrates, a production considerably in excess of any former year and more than double the 990 tons produced in 1914. The imports of tungsten ores during 1915 according to figures obtained from the Bureau of Foreign and Domestic Commerce were 1,776 short tons of ore valued at \$1,044,866 against 299 tons valued at \$139,687 in 1914. In the first quarter of 1916, 967 short tons of tungsten ores valued at \$1,721,323 was imported. Besides ore there were imported in 1915, 8 short tons of tungsten metal and ferro tungsten valued at \$9,588, and in 1914, 218 tons valued at \$22,447. It seems from the data at hand that nearly all of the ore imported during the first quarter of this year came from South America, as the countries under the control of the Allies were under an embargo on the shipment of tungsten or tungsten ores. In our country no reliable figures for the production in 1916 are yet available, but undoubtedly the production has been far ahead of any similar period of former years. In other parts of the world an increase of production, like that in North and South America, has taken place.

#### PRODUCTION IN BURMA

Burma is reported (*Mining Journal*, London, February 19, 1916, p. 123) to have produced during 1915, 2,116 long tons of concentrates. These concentrates are thought to average about 67.5 per cent WO<sub>3</sub>, so that they are equivalent to about 2,677 short tons of 60 per cent concentrates. The Indian government imported 2,000 Chinese laborers and these have been put to work on such properties and in such numbers as government representatives have decided, and as a result there will undoubtedly be a considerable increase in production in 1916. The output for the first quarter of 1916 (*Mining Journal*, London, May 27, 1916, p. 363) was 617 long tons (777 short tons of 60 per cent concentrates) as compared with 616 short tons for the first quarter of 1915.

In Queensland (*Queensland Government Mining Journal*, March, 1916, p. 117) 418.3 long tons of tungsten ores and 246.9 tons of mixed tungsten and bismuth ores were produced in 1915 against 240.9 and 193.05 tons, respectively, in 1914. Tungsten ores are understood to be usually con-

centrated to 70 per cent WO<sub>3</sub> in Australia and arbitrarily taking the tungsten bismuth ores to be half tungsten ore of 70 per cent grade the output for 1915 is equivalent to 708 short tons of concentrates carrying 60 per cent WO<sub>3</sub> against 442 in 1914. There has probably also been an increase of production in other parts of Australia.

#### BUY LITTLE HERE

The Allies have been supplied mostly from these and other colonial sources, so that they have taken little tungsten from this country. The exports of tungsten and ferrotungsten for the ten months ending April 30, 1916, were only 123,896 pounds, valued at \$173,160. No statistics for exports of ore are available, but as the price was fixed by the British government at 55 shillings a unit (long ton), a price far below that in this country, it is not likely that much was exported.

This spring production in this country and in the world at large has been at the highest point ever known. At first the sudden demand created by the orders for war steel was far ahead of the instant productive power of the country. The rapid increase in prices, starting at a time when tungsten mining was at a low ebb and culminating in the undreamed maximum of \$110 a unit in March, caused prospecting and consequent discoveries of new deposits; increase of development of known deposits; the operating at high tension of old, and the hasty building of new mills, so that the increase in production was very much faster than the increase in consumption and soon overran the demand which would absorb the output at the extremely high prices and a drop in prices was and is still inevitable, so that it seems safe to prophesy they will reach a considerably lower level.

#### NORMAL PRICE

What the normal price will be on the return of peace conditions is now hard to estimate, but it seems possible that when the demand recedes to its natural proportions prices may, owing to over-production and unless hindered by artificial means, fall close to the level of those obtaining before the war.

As in all times of such sudden and great rises in prices, many properties unworkable in ordinary times will have been opened and equipped for operation, sometimes without due regard for the future, and some schemes have bordered close on or have been entirely fraudulent. The investors in all three classes will be hurt by the inevitable results. Other properties properly handled will logically close, and with a profit, on the advent of the lower prices sure to come, and others will have been developed which can operate profitably under normal conditions of trade.

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#### Rice Acts as Director.

George S. Rice, chief mining engineer of the Bureau of Mines, acted as director of the Bureau last month during the absence of Van H. Manning in the West.

**GOVERNMENT EXPERTS WELL  
KNOWN TO MINING MEN**



C. T. LUPTON  
Geologist

To accept an important position with the Cosden Oil & Gas Company, of Tulsa, Okla., Charles T. Lupton has tendered his resignation to the United States Geological Survey. Mr. Lupton will serve the Cosden Company as a geologist.

Mr. Lupton was born in Mount Pleasant, Ohio, February 28, 1878. His education was acquired in the public schools at Mount Pleasant and in the Oberlin Business College and Oberlin College. From the latter institution he received a degree of A.B. in 1907. Later he was awarded a degree of LL.B and LL.M. by the National University Law School in Washington. Mr. Lupton began with the Geological Survey in 1907 as geologic aide. In 1910 he was made a member of the coal land classification board of the Survey, and has been in charge of some very important work in the following mining regions: Bull Mountain District, Montana; Orofino District, Idaho; Western part of Olympic Peninsula, Washington; Gallup District, New Mexico; Northeastern and central Utah mining districts and northern and central mining districts of Wyoming.

Mr. Lupton will begin his new duties next month.

**GEOLOGISTS PLAN INTERESTING  
SUMMER FIELD TRIP**

Geologists from twenty-five States are expected to join in a field trip which will be given by the Associated American State Geologists early next month. George Otis Smith, director of the Geological Survey, will accompany the geologists. The itinerary is as follows:

Monday evening.—Assembly and conference in the State Museum.

Tuesday.—By train or auto to the Helderberg Mountains; classical section of the Paleozoic from "Hudson River Shales" (Indian Ladder and Canajoharie beds) up through the "Lower Helderberg" (Manlius Coeymans, New Scotland) Oriskany, "Upper Helderberg," Onondaga, Marcellus, Hamilton. Panorama of the Mohawk and Hudson from the Indian Ladder Cliff, an extensive view of erosional topography on a very large scale.

By auto to Thompson's Lake. Thompson's Lake lies on a limestone plateau in a karst or solution cavity with concealed outlet. This Helderberg limestone plateau is notable for its karst topography.

Return to Albany by auto or train.

Evening conference in State Museum.

Wednesday.—Leave by train for Saratoga Springs; autos through the State Mineral Springs Reservation under guidance of the officials. Exposition of the hydrology and geology of the Springs basin (140 mineral springs are now spouting under CO<sub>2</sub> head.)

Autos to Lester Park or Cryptozoon Ledge (property of State Museum) a reef of marine algae in the Hoyt (Cambrian limestone).

Train to Port Henry, Lake Champlain, faulted Ordovician (Beekmantown and Trenton); Pre-cambrian (Greenville, syenites, gabbros) along railroad. Cheever Magnetite mine.

Evening at Port Henry.

Thursday.—Train to Mineville; Witherbee, Sherman Co. magnetite mine, largest in America. Examination of mine and mine workings.

Afternoon to Port Henry, to Port Kent; sections of Potsdam and crystallines along the lake front south of Port Kent.

Night at Port Kent.

Friday.—Port Kent to Ausable Chasm, a post glacial gorge through Potsdam sandstone; very picturesque.

From Port Kent by motor or steamboat to Cliff Haven (fourchite and monchiquite dikes) and Valcour Island (extensive Ordovician section) thence to Plattsburg.

Evening at Plattsburg.

Saturday.—From Plattsburg across Lake Champlain to Burlington, Vt. Meet State Geologist Perkins of Vermont and under his direction visit the attractive University of Vermont.

The only possible source in the United States of material for making agate mortars and pestles known to the U. S. Geological Survey is near Austin, Texas. Here agate nodules weather out from some of the sedimentary beds and are said to be suitable for such work.

### **U. S. MINES LITTLE NICKEL; SOME SAVED AT SMELTERS**

A little nickel ore is said to have been mined in southern Nevada within the past year, but the Geological Survey has no definite information with regard to it. The other nickel deposits have been idle but a considerable quantity of nickel, probably between 700 and 1,000 tons, is produced as a by-product in the electrolytic refining of copper. Most of this nickel is now produced in the form of very pure metal by electrolytic processes, though a considerable quantity is still put on the market as nickel salts for use in plating. In the United States there are nine or ten nickel properties which are potential producers of the metal, though not on a scale comparable to the possibilities of nickel mining at Sudbury, Ontario.

### **IMPORTANT FIELD MEETS IN INDIANA AND ILLINOIS**

Important field meets of mine rescue and first aid men are to be held this month in Indiana and Illinois. Each will be the most important event of this kind ever held in the State. The Indiana meet will be held at Clinton, September 4, and the Illinois meet at Spring Valley, September 9.

W. D. Ryan and Dr. W. A. Lynott, of the Bureau of Mines will attend. In addition, D. J. Parker, H. I. Smith, J. R. Fleming and G. T. Powell will represent the Bureau of Mines at one or both of these meets.

### **Ready for Distribution**

Among the publications which became ready for distribution by the Geological Survey during the past month are the following:

Bulletin 640-B, "Reconnaissance of the Connelly and Ruby Mining Districts of Washington," by Edward L. Jones, Jr.

Bulletin 642-D, "Mining on Prince William Sound in Alaska," by EBrtrrand L. Johnson.

Bulletin 642-H, "The Cosna-Nowitna and Ruby-Kuskokwim Regions, Alaska," by H. M. Eakin, J. B. Mertie, Jr., and G. L. Harrington.

Bulletin 623, "Petroleum Withdrawals and Restorations Affecting the Public Domain," by Max W. Ball.

"Platinum and Allied Metals in 1915," by James M. Hill.

"Bauxite and Aluminum in 1915," by W. C. Phalen.

### **Peru Furnishes Bulk of Vanadium**

The great supply of vanadium comes from the sulphide ores (patronite vanadium sulphide) of Minas Ragras, Peru, which are mined by the American Vanadium Company of Pittsburgh, and from the roscoelite (a vanadium mica) bearing sandstones of southwestern Colorado, which are mined by the Primos Chemical Company at Vanadium Colorado.

### **OVER HALF MILLION VISIT THE SAFETY FIRST SPECIAL**

During a four months' tour of the country, 500,000 persons visited the Government Safety First Special. The train returned to Washington August 31. The exhibits have been dismantled and the cars returned to the Baltimore and Ohio Railroad Company.

As a result of the extensive tour made by this train an insistent demand has developed in many parts of the country to see this exhibit, which shows some of the work being done by the Government to safeguard life and property. There is strong sentiment to make such an exhibit permanent. The matter is now being considered by the Secretary of the Interior and it is possible that Congress will be asked to appropriate for a train of this character.

### **HEALD BEGINS STUDY OF OSAGE OIL LANDS**

Work of mapping the detailed geological structure in the Pawhuska Quadrangle in the Osage nation of Oklahoma is being undertaken by K. C. Heald, of the United States Geological Survey. Mr. Heald will continue the studies begun by Carl D. Smith prior to his resignation from the Geological Survey. It is expected that this work will now be brought rapidly to completion. The Pawhuska Quadrangle includes some of the most important oil and gas lands in the country.

### **VERNADSKY HEADS GEOLOGICAL BUREAU OF RUSSIAN EMPIRE**

W. Vernadsky has been made director of the Museum of Geology and Mineralogy of Russia. He also has been elected to the upper house of the council of state, being one of the six members chosen from the universities of the Empire. Mr. Vernadsky is known to a large number of geologists in the United States as he made an extended visit here four years ago.

### **Divide Up Phalen's Work**

As a result of the resignation of W. C. Phalen, from the Geological Survey, to accept a position with the Bureau of Mines, H. S. Gale has taken over his potash work. Mr. Gale also has been working on potash and is recognized as one of the country's leading authorities on this mineral. P. S. Smith will take over sulphur, iron, pyrite and sulphuric acid. R. W. Stone will take up Mr. Phalen's work in phosphate salt and bromine. J. M. Hill will take over the work of bauxite and aluminum. No addition to the force will be made as a result of Mr. Phalen's resignation.

### **Manning Honored.**

Van H. Manning, Director of the Bureau of Mines, has been appointed a member of the National Research Council of the National Academy of Sciences.

## OKLAHOMA INCREASES SPELTER PRODUCTION BY MORE THAN 15,000 TONS

**Output of Zinc Ores During the First Six Months of Current Year Shows Considerable Increase—Consumption Also Increases, But Not in Same Proportion as Output**

Figures compiled by C. E. Siebenthal, of the United States Geological Survey, Department of the Interior, from reports submitted by all zinc smelters operating during the first six months of 1916 show that the production of spelter from domestic ore in that period was 267,606 short tons and from foreign ore 48,756 short tons, a total production of 316,452 tons, compared with 272,987 tons for the last half of 1915 and 216,532 tons for the first half.

The output of spelter by Illinois smelters increased over 5,000 tons for the six-month period, and that of Kansas over 8,000 tons, but the gain in Oklahoma was the greatest of all—over 15,000 tons—a result of the completion of a part of the large contemplated increase in smelter capacity announced early in the year. The remaining spelter-producing states also made a large gain, principally in Pennsylvania, where the new smelter at Donora was put into complete operation. The output of primary electrolytic spelter, amounting to 1,697 tons, is also included in the production of these states.

The stocks of spelter held at smelters on June 30, 1916, amounted to 23,817 tons, against 14,253 tons at the beginning of the year and 5,884 tons at the middle of 1915. This shows a gain over stocks at the close of the year, part of which was doubtless due to the accumulation of working stocks at new smelters which started during the period.

From the foregoing figures and the records of the Bureau of Foreign and Domestic Commerce it is calculated that the apparent consumption for the period was 229,086 tons, which compares favorably with 203,588 tons for the last half of 1915 and 160,906 tons for the first half. This consumption was not altogether domestic, however, for it must include the zinc content of the exports of brass and brass articles, which, as will be seen from the table of exports by classes, were largely increased during the first half of the present year.

In addition to that produced from ore, 15,800 tons of spelter was distilled or recovered electrochemically from zinc ashes, skimmings, and drosses. Probably one-fourth of this output of secondary spelter including the considerable quantity of electrolytic secondary spelter, was of high grade. No statistics were obtained of the spelter produced by remelting skimmings, drosses, etc., but it was probably not less than 12,000 tons. The

total output of spelter from both ore and skimmings was therefore about 344,000 tons, or at the rate of 688,000 tons a year.

### **MINERS' CIRCULARS IN FOREIGN LANGUAGES TO BE OUT SOON**

Within two months the Bureau of Mines hopes to have ready for distribution circulars with regard to Safety First and First-Aid Work in mines. Three foreign languages are to be used in setting forth this information. These circulars will be issued in Italian, Polish and Slovak. In each case the English from which the translation is made will appear in a parallel column.

Numerous applications are now being received asking that the same circulars be printed in Finnish. It has been brought to the attention of the Bureau of Mines that there are a large number of Finnish miners in the country, and it is probable that the circular will be translated for them as well.

Since the establishment of the Bureau of Mines the plan of publishing certain information in foreign languages, so as to reach the miners who are not familiar with English, has been considered. At first considerable opposition developed to this plan. It was argued that it would retard the efforts of the foreigners to learn English. Since it is so highly desirable that all immigrants acquire a knowledge of English, the Bureau of Mines deferred the publication of these circulars until an investigation could be made.

It has been established that of the 750,000 mine laborers in the United States nearly one-half are foreign born. Considering the few educational advantages which were enjoyed by this class previous to their coming to America they make remarkable progress with the English language. Among those who come to this country after attaining the age of thirty years however, it has been noted that few of them acquire a sufficient knowledge of English to read it readily. In fact where they are able to read English at all it is so labored as to be a hardship. After this was established it was decided that great good could be done by circulating the information in the native languages of the miners. By placing the English translation in a parallel column it is believed that it will be of actual instructive value and will tend to encourage the learning of English rather than retard it. It is the intention of the Bureau of Mines to amplify this service as soon as its utility is proven in actual practice.

**GOVERNMENT EXPERTS  
WELL KNOWN TO MINING MEN**

(See Cut on Front Cover.)

Philip S. Smith was born at Medford, Mass., July 28, 1877. His early education was secured in the public schools around Boston, and in a preparatory school at Poughkeepsie, N. Y., after which he entered Harvard and was an under-graduate until 1899 in which year he received his A.B. degree. He was awarded a degree of A.M. at Harvard in 1900 and in 1904 the degree of Ph.D.

Mr. Smith undertook his first work in the copper mines of Vermont and later joined the Geological Survey of Michigan. His work with the latter organization was exclusively in the copper district of the upper peninsula. Following this he spent some time in private employ, doing geological work in the Lake Superior region in Canada in iron and at the zinc deposits of New Jersey.

During his service with the United States Geological Survey, Dr. Smith has done work in the Black Hills, in the gray iron ore district of Alabama, and in the following mining districts in Alaska: Nome, Solomon, Seward Peninsula, Nulato-Council City, Toyukuk, Kobuk-Noatak, Fairbanks, Ketchikan and Illama-Iditarod.

Since 1914 Dr. Smith's work has been confined largely to service in the Washington office as administrative geologist. In the absence of the director he serves as acting director.

During the current year Dr. Smith found time to make an investigation as to the field occurrence of sericite as a source for potash. He also just has completed a description of the topography and physiography of the Watkins Glen region of New York.

For four years Dr. Smith was instructor in geology and physiography at Harvard, in addition giving courses on the economic geology of certain non-metallic products, and summer courses during which he visited the various mining regions of Colorado. During that same period he also was instructor in Radcliffe College.

In the reassignment of the work at the Survey, made necessary by the resignation of W. C. Phalen, Dr. Smith will take up the work of sulphur, iron pyrite and sulphuric acid.

Dr. Smith is a Fellow in the Geological Society of America, a member of the Association of American Geographers, Geological Society of Washington, The Washington Academy of Science and the Harvard Travellers' Club.

**DIFFERS FROM WOODBRIDGE  
AS TO ORE SAMPLING**

After reading the interview with T. R. Woodbridge on the "Standardization of Ore Sampling Methods," which appeared in the August issue of the MINING CONGRESS JOURNAL, F. Meyer, 618 14th Street, Denver, Colo., submits the following conclusions with regard to the standardization of ore sampling methods. It will be noted that in some points Mr. Meyer's conclusions vary from those of Mr. Woodbridge. Mr. Meyer's conclusions are summed up as follows:

1. High grade ores, especially spotty gold or silver ores, require a particularly large sample with fine crushing and grinding.
2. Medium and low-grade ores of fairly uniform character do not require such a large sample nor such fine crushing and grinding.
3. It would be, therefore, waste of time and money to make one standard method of ore sampling obligatory for all smelters and sampling works.
4. The crushing of all the ores to one quarter of an inch or even to half an inch would be prohibitive for the running of custom smelters with pyritic smelting.
5. If the ore is spotty, no matter how carefully the sampling is done and how finely the ore is ground, there is always a larger or smaller discrepancy of values in the different assay samples.
6. The keeping of at least 2 per cent of the ore as sample for eventual resampling until settlement is made ought to be ordered by law for all custom smelters and public sampling works.
7. The old method of taking every tenth shovel from large lots of low-grade ores gives satisfactory results to everybody concerned if the rest of the sampling is done with due care and cleanliness and if also proper care is taken that the proportion of fine and coarse material is maintained in the sample.
8. The sampling of ores including moisture sample just as well as the weighing is, and always will be, a matter of trust.
9. As a panacea against certain deficiencies in the ore sampling works and in the marketing of the ores a bill was introduced, several years ago, in the State Assembly of Colorado to erect State sampling works in the different mining camps and mining centers of the State, thus regulating not only the sampling but also, to a certain degree the marketing of the ores, as it is not so much the sampling itself as the various charges, penalties, deductions, variations of prices in the different grades of ores (compare f. i. schedules of lead and zinc ores) which cause distrust and dissatisfaction. The bill was killed before its first reading by the influence of certain interests.

As a compromise, it might be suggested that the sampling foreman of every custom smelter and sampling works be a *government employee* paid by the government and qualified to select the one method of sampling suited best to local conditions and character of ores.

F. M.

**GOVERNMENT EXPERTS WELL  
KNOWN TO MINING MEN**



MAX W. BALL  
Bureau of Mines.

Max W. Ball, mining engineer, of the Bureau of Mines, comes of a race of school teachers, but claims that he himself has so far avoided teaching. His father taught between farming seasons in Illinois, his mother taught in Iowa, his only sister is now teaching in Denver, and most of the rest of his near relatives have taught at one time or another. Enough is enough for one family, says Ball, and so, although he has been burro-guide, cowpuncher, farm hand, miner, surveyor, engineer, geologist, and lawyer, he has never been a school teacher.

Ball says he wasn't lucky enough to be born in the West, but had the good fortune to be taken there at an early age. He was born in 1885 on a farm in Munson township, Henry County, Illinois, where he flourished with the calves and the corn-fed pigs to the age of seven. Then his father died, and his mother took him and his sister to live in Geneseo, Illinois. Three years later they moved to Manitou, Colorado, where they lived until Ball finished his high school work. From his father he inherited a fondness for horses not too gentle, and at twelve he was in the saddle as a burro-guide. This,

with intermittent work ranging from wheelbarrow to roundup, kept him more or less out of mischief and more or less in funds through succeeding summers.

When Ball graduated from Manitou high school the family moved to Golden, Colorado, where Ball entered the Colorado School of Mines. Between terms he went back to the Pike's Peak trail or mucked and trammed in the mines of Idaho Springs and Central City. In 1906 he graduated with degree of Engineer of Mines.

For a short time he carried chain and took out logarithms for a deputy mineral surveyor in Central City, but there was too much office work for Ball's taste. When an offer, indefinite as to terms and none too promising in tone, came to join a United States Geological Survey party, he was on his way within twelve hours. On August 3, 1906, he joined the Survey at Rawlins, Wyoming, and until April of this year he had been with the Survey ever since.

The Rawlins party was under A. C. Veatch and was doing topographic and geologic mapping of coal fields. Ball acted as teamster and field assistant and when the summer was over Veatch brought him to Washington as a draftsman. The following summer he was given charge of a party mapping the Little Snake River coal field of southern Wyoming and northern Colorado, which work he continued for nearly two years.

His life in the West and his association with Veatch had given him a deep interest in public-land matters, and in March, 1909, he was placed on the staff of the Land Classification Board, recently formed to handle problems connected with the Survey's conservation work. His especial interest was in cooperation with the Land Office in the exchange of data regarding the mineral character of public lands, and of this work he had immediate charge from the adoption of the first cooperative agreement to the time of his leaving the Survey. He early found that public-land problems have many legal aspects, and he accordingly entered the National Law School, from which he received the Master of Laws degree in 1914, being admitted to the Bar of the District of Columbia in October of the same year.

Late in 1910 he was made Chairman of the Oil Section, Land Classification Board, and for the remainder of his time with the Survey he gave especial attention to oil matters. He is particularly interested in problems connected with the leasing of oil and gas lands and with Government administration of its oil fields. Just before leaving the Survey he prepared a bulletin giving the history and purpose of oil-land withdrawals and containing an exhaustive discussion of oil-land law. He has spent much time in the coal and oil fields of Wyoming, Colorado, New Mexico, and Utah, and has visited those of other States.

On April 1, 1916, Ball transferred to the

Bureau of Mines, where most of his time is given to legal and administrative matters, though he still keeps in touch with the oil situation.

In addition to the bulletin already referred to, Ball has written preliminary reports on the Little Snake River coal field, published in Survey Bulletins 341 and 381; "The History and Legal Basis of Land Classification," appearing as a chapter of Bulletin 537; and a paper on "The Placer Law as applied to Petroleum," published by the American Institute of Mining Engineers.

#### LIGNITE GAS SHOULD BE USED LARGELY FOR HEATING, IT IS SAID

Because of the ease with which the gas is produced, the low price of the original lignite, the value of the residue, and the low price for which it could be sold if manufactured in a plant used to produce briquets from the residue, the lignite gas should have a large commercial utilization for heating, lighting, and power purposes. It has been found that briquets made from this concentrated residue produce a most excellent fuel, for all practical purposes approaching the efficiency of anthracite, says E. J. Babcock, of the Bureau of Mines, one ton of the air-dried lignite will produce from a half to two-thirds of a ton of briquets in addition to 8,000 or 10,000 cubic feet of gas. The briquets have about twelve-thirteenths the actual heating value of hard coal, and they can be shipped for considerable distances and still prove profitable. The briquets present many advantages, especially over the original lignite as usually placed on the market. The heating value is nearly doubled, the briquets do not disintegrate on standing or burning, they can be stored without being affected by atmospheric conditions, they are uniform in size and are convenient to handle.

No detailed statements of the cost of operating a large commercial plant are given in this report for the reason that the cost per ton of briquets and per 1,000 feet of gas and other by-products will depend upon a large number of factors, any one of which may materially affect the cost. For example, the cost of production is much less in a large plant than in a small one, and also less in a plant favorably situated—that is, near a mine, a city, and railway facilities. The use of mine slack, the percentage of moisture in a given lignite deposit, and the relative cheapness of mining and ease of delivery to the plant are all variable conditions and would have to be determined for each individual plant.

In addition, the plant could be operated under many modifications of the general process that has been explained; for example, all or a part of the gas might be sold for heating or lighting purposes or converted

into electricity. The extraction and production of gas might be carried further in one plant than in another, or the by-products, such as tar and ammonia, could be recovered and marketed, used in part, or entirely neglected. Differences in any of these conditions would materially modify the cost of production.

In general, the larger the plant and the more complete the saving of by-products the smaller will be the cost of production. It is believed that in a carefully constructed and operated plant the saving and utilization of the various by-products will so reduce the cost of operation as to make the industry commercially practical and profitable.

All of the data obtained from the investigations and the operation of the experimental plant indicate that a plant of fair capacity, if so constructed as to economize in the original cost, as well as in the cost of operation, and if operated efficiently and under careful management, should turn out excellent commercial products at a cost that would admit of a fair profit.

Although the general principles involved in the process explained are not complicated, the proper observance of the many details of operation is essential to success, and those managing and operating the plant should have had technical training and experience.

The development of methods for the utilization of low-grade coal will prove of much value to those communities nearest the great lignite deposits in the West. In some of these the lignite could be converted into electricity, which, in turn, could be sent to surrounding towns and villages, thus distributing power and light from numerous central power plants. Such an arrangement would not only be a great saving of our fuel resources but would also result in the establishment of many industries that can be developed by abundant and cheap electric power, Mr. Babcock concludes.

The existence of vast deposits of lignite in the West Central and Western States is well known, although the extent and importance of the deposits have not been appreciated, nor has there been an adequate economic utilization of the deposits.

The work of the Bureau of Mines, the United States Geological Survey, and the State geological surveys is disclosing an increasingly large area, underlaid with this kind of coal. Among the States having the largest workable deposits may be mentioned North Dakota, Montana, Wyoming, Colorado, and Texas, and in several other Western States lignite occurs in smaller areas. In North Dakota alone it is estimated that the deposits cover approximately 32,000 square miles, many of them being 10 to 15 feet thick and capable of producing in all several hundred billions of tons of lignite.

**PHALEN LEAVES SURVEY FOR  
BUREAU OF MINES BERTH**



W. C. PHALEN

Now with the Bureau of Mines.

W. C. Phalen of the Geological Survey has been transferred to the Bureau of Mines at an increased salary. Mr. Phalen is credited with having done very excellent work on the Survey on sulphur, salt, potash, salines, bauxite and phosphate. He goes to the Bureau of Mines as mineral technologist under Dr. Charles L. Parsons.

**BUREAU OF MINES RESCUE  
CARS TO BE REPAIRED**

George S. Rice, chief mining engineer of the Bureau of Mines, appeared last month before the appropriation committee of the House to emphasize the need of the \$26,000 asked for by the Bureau of Mines for repairs to existing mine rescue cars. Inspectors of a number of railroads have refused to haul these cars owing to their lack of repair. No appropriation has been furnished for repair work and a number of the cars have been running for many years without attention. The appropriation was included in the deficiency bill.

**NEW MINE RESCUE CARS  
ARE BEING CONSTRUCTED**

A contract has been let by the Bureau of Mines for three new steel mine rescue cars. The new cars are to be situated at Reno, Nev., Raton, N. Mex., and Butte, Mont. They will be completed in January. Owing to the wording of the appropriation the crews cannot be put out in advance of the cars, thereby handicapping, to a considerable extent, work which should have begun at once.

The cars are being built by the American Car and Foundry Company, at Wilmington, Del. The cars will be the last word in improved rescue cars.

**MILWAUKEE ASKS BUREAU  
OF MINES FOR ADVICE**

As a result of the efficient work done by the Bureau of Mines at the Cleveland tunnel explosion, a request has been made by the city officials of Milwaukee asking that the Bureau of Mines advise with the city engineer in regard to the extension of a tunnel under the lake at Milwaukee in which similar conditions are liable to be encountered. The request has not been acted upon as yet, but it is practically certain to be granted.

**Puts Journal on Pedestal**

An unsolicited testimonial with considerable "punch" in it comes from S. O. Stewart, General Manager of the Premier Mining Company, of Winkelman, Arizona. He says:

"I wish to congratulate you upon putting out such an interesting journal. I read every article in it with avidity. I take other mining papers but no one of them compares with the MINING CONGRESS JOURNAL."

**Rittman Process Popular**

Licenses have been granted to twenty-three oil refiners for the use of the Rittman process. No royalty is charged for the use of this method of refining, but each person taking out a license agrees to patent, in the name of a trustee for the public, all improvements that may be devised or discovered. In this way it is believed that the public will be the chief beneficiary of the Rittman discovery.

**Matthew Henry Walker Dies**

Matthew Henry Walker, president of the Walker Bros. banking house of Salt Lake City, died July 28. He had been an active member of the American Mining Congress for many years.

**To Meet in Birmingham**

Birmingham, Ala., will be the scene of the next annual meeting of the Lake Superior Mining Institute. It will be held there March 13 to 17.

## CONGESTED STORAGE AND OVERPRODUCTION CAUSE OIL PRICES TO TUMBLE

Development in Kansas Slows Up Drilling in Mid-Continental Field, it is Said—Million Dollar Refining Company to Operate in Oklahoma Field

(Special Correspondence)

Tulsa, Okla., Aug. 25.—The price of crude oil of the Mid Continental oil field has been reduced recently from \$1.55 to 95 cents. This applies on light oils, paraffine base, ranging in gravity from 32 to 41.

The pipe line companies state that the reason of this reduction is on account of the congestive storage and over-production in the larger fields of Kansas and Oklahoma. Drilling operations have practically ceased in all of the fields to give the pipe line companies an opportunity to move this congestive storage.

The only wells that are being drilled at present are offset wells and wells that are required to be drilled to hold leases. All of the oil operators, however, firmly believe that the market will soon react and that the price of crude oil in this section will bring a higher price than before the decline.

Many of the independent operators are now building small refineries and putting their oil in storage from the wells already drilled in so as to sell the refined products to the different jobbers of refined products in the North, and therefore secure a better price for their oil worked up into refined products than they could secure by selling it in the crude state at the present selling price of crude oil.

The Marion Refining Company has been chartered by the State of Oklahoma with a capitalization of \$250,000 and is now amending its charter, increasing its capital stock to \$1,000,000 and the papers on it will be filed in a few days. The officers and directors of the refining company are: A. M. White, president (president of the Starky Oil & Gas Company and vice-president of the White Oil Company); A. S. Nelson, vice-president (president of the Albemarle Producing Company and treasurer of the Grand River Gas Company), and G. W. Fry, secretary and treasurer (vice-president of the Albemarle Producing Company and vice-president of the Grand River Gas Company), and the refinery will be erected and completed as soon as possible at Chelsea, Okla., 18 miles north of Claremore.

The Chelsea oil of the Chelsea field, runs high in gasoline and the Marion Refining Company is now arranging to sell its gasoline, distillates and refined products. The daily capacity of the refinery will be from

1,000 to 3,000 barrels per day and the refinery will be so constructed with units that the capacity can be increased to 10,000 barrels per day.

The officers of the refining company are officers in three producing companies, and these producing companies will sell its production to the refining company. In addition to this, the refining company will buy additional crude on the open market by contract from other independent producers. The refining company expects to be in operation and selling its products within the next four months.

Mr. George W. Fry, secretary and treasurer of the refining company, is now in the North in the interests of the refining company.

The securities of the refining company are being sold through Terry & Brinkley, of Guthrie, Okla., who have northern connections.

### NICKEL PRODUCTION IN 1913 WAS 30,000 TONS

The latest statistics of the world's nickel production available at the U. S. Geological Survey are those given by the Metallgesellschaft of Hamburg, for 1912, in which the production is listed as follows:

Canada, United States, and England (all of this production is from Canadian ores)	20,200 metric tons
Germany.....	5,000 metric tons
France.....	2,100 metric tons
Other countries.....	1,200 metric tons
Total.....	28,500 metric tons

For 1913 the total is given as 30,000 metric tons but is not itemized.

### Amenable to Flotation

Molybdenite seems to be more readily amenable to separation by one of the flotation processes, either oil or the surface tension of water, than to separation by gravity. Henry E. Wood & Company, 1734 Arapahoe Street, Denver, Colorado, has worked out a process for the separation of molybdenite from its gangue by flotation through the surface tension of water.

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**EDITORIALS**

**THE REVENUE BILL AND  
THE MINING INDUSTRY.**

It will be gratifying news to the mining men of the country that the Senate Finance Committee has recognized the injustice of the provision of the present income tax act with reference to deductions authorized from gross income in estimating the net income upon which the Federal Income Tax is levied.

It will be recalled that the act, over the protest of mining men, fixed a limit of five per cent of the gross value of the output of mineral as the maximum amount which could be deducted from gross income for depletion and exhaustion. At the time of the enactment of the original income tax bill the gross unfairness of singling out the mining industry for special restrictions was pointed out and further that the mineral taken from a mine took just that much from the total value of the property and was a sale of a part of the property rather than an income from its operation. In the case of the United States vs. the Nipissing Mines Company the conclusion reached by Judge Lacombe in the United States District Court for the southern district of New York upheld

this conclusion. A part of this opinion is as follows:

"If the known value of an ore bed were exactly \$2,000,000 and exactly \$500,000 were taken out of it each year, in four years there would be nothing left. It is difficult to say why it may not reasonably be said that the ore bed suffers each year a depreciation of \$500,-000, just as a \$10,000 piece of machinery, with a life of ten years, suffers a depreciation of \$1,000 each year."

Notwithstanding this illustration the law provided a limitation of five per cent and the Commissioner of Internal Revenue construed this to mean 5 per cent of the selling price. The average selling price of coal in the Pittsburgh district last year was approximately \$1.20 per ton. A five per cent deduction amounts, under the present law, to six cents on each ton of coal mined. In the Pittsburgh district coal lands have cost the operators approximately ten cents per ton of coal in the ground. This value is constantly enhanced by taxes and interest upon the investment. It would be a fair assumption that the royalty value of coal in the Pittsburgh district is at least fifteen cents per ton. The deduction of six cents allowed under the present law leaves the remaining value of nine cents on each ton of coal mined, subject to a tax which is in reality a tax upon the capital invested rather than upon the income, an injustice which is so apparent that no argument is necessary for its demonstration.

Pittsburgh is cited because it is the center from which a larger amount of coal is mined than in any other one district.

In the metal mines the injustice is even greater than in the coal mines because the royalty value of these properties is greatly in excess of the proportionate royalty value of coal. Ten per cent is about the lowest royalty ever considered for low grade ores and in many instances a royalty as high as seventy-five per cent has been paid to the mine owner by a lessee operating under the royalty basis. This has worked a very great injustice to many of the large mining companies, and would have been still

more burdensome under the increasing percentages to be levied by the present revenue bill.

The members of the Senate Committee on Finance are to be congratulated for having given the mining industry a fair deal and it is hoped that these provisions of the bill will meet the approval of both the Senate and House.

Attention is called to the news columns where the exact language of the paragraph of the revenue bill dealing with this matter is quoted verbatim.

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#### MID-YEAR STATEMENTS PUBLISHED WIDELY

Through the returns from clipping bureaus it is possible to establish quite definitely that a circulation of no less than 35,000,000 has been given the mid-year reports of the United States Geological Survey on the mineral output of the country during the first six months of the current year.

Few undertakings on the part of any bureau have been crowned with such spontaneous success. The secret is that the statements, giving the returns on mineral production, were given out while the information they contained was news.

These reports do not contain the same details as do the regular reports which appear later, and, of course, they are not absolutely accurate. They are so nearly correct, however, as to be all that is required for the general public. In fact many technical men find the mid-year and year-end statements sufficient for their work.

Newspapers of the country are very ready to publish current data. Newspapers are not histories, however, and they are very begrudging of any space for a report referring to past conditions.

It is greatly to the interest of the mining sections of the country that more publicity be given their great industry. Publication of information aggregating thousands of columns, showing the immense values of the country's mineral production brings home to people not directly interested the importance of the mining enterprise.

While nearly all newspapers, great and

small, in the mining sections of the country used these mid-year statements their publication was not confined to newspapers in mining areas. New York papers as well as papers in the large cities throughout the country used this matter quite fully. A large percentage of the smaller papers also used a great deal of this material.

Director George Otis Smith of the Geological Survey is a result-getting sort of individual and the mining industry is profiting hugely as a consequence of the work's being done by the powerful organization with whose direction he has been entrusted.

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#### INTEREST IN SMOKELESS FIRING OF COAL

The demand from the public for technical paper 80 of the Bureau of Mines, which deals with the proper methods of firing coal, became so great as to necessitate its reprinting. Many meritorious publications are offered to the public but in some cases they apparently are not appreciated. This was not the case, however, with technical paper 80. The demand for it was heavy from the time of the announcement that it was ready for distribution. It indicates that the public is very much interested in suppressing the smoke nuisance and also shows that the consumers of coal are realizing that their bills can be curtailed importantly by proper firing.

Considerable difficulty has been experienced in securing anything like general co-operation in suppressing the smoke evil in Pittsburgh. According to information from the Bureau of Mines this is due to the fact that coal is cheaper in Pittsburgh than at nearly any other point in the United States. Since this removes the important incentive for burning coal smokelessly, the average purchaser of coal is not impressed with the idea of going to any trouble to save a small percentage of the coal consumed. As a consequence the average cost of making steam in Pittsburgh is no lower than it is in the copper district of Michigan where coal is worth twice as much. Coal becomes sufficiently valuable at the Michigan copper mines to

direct attention to its conservation. With careful firing little smoke is poured out into the atmosphere.

All urban communities are interested in keeping cities clean. Most consumers of coal are anxious to keep their fuel expenses at the lowest point possible. They are learning that firing a furnace can be done a right and a wrong way. The Bureau of Mines is responsible to no small extent for this changing tendency.

#### MR. LANE AND MR. PINCHOT

It will come as a surprise to many Westerners that Mr. Franklin K. Lane, Secretary of the Interior, has incurred the displeasure of Mr. Pinchot.

Possibly no man in times of peace has drawn to himself, in any large section of the country, more bitter animosities than has Mr. Pinchot in the Rocky Mountain States and Alaska. As Secretary of the Interior, Mr. Lane has also been severely censured by the West because of his apparent approval of the Pinchot so-called conservation policies.

In an open letter addressed to Mr. Lane Mr. Pinchot says:

"Your plan to turn the natural resources of Alaska over to a bi-partisan political combination embodied in the Pittman Bill, now before Congress, which bill you have been diligently trying to get passed, if passed would open the way for a destruction of our whole system of National Conservation."

The Alaskan coal situation furnishes the most striking illustration of what Mr. Pinchot calls "our whole system of National conservation." In furtherance of this policy, the coal lands of Alaska were withdrawn from entry by President Roosevelt in the year 1906 "in aid of legislation." The legislation proposed was the establishment of a Federal leasing system and in order that this system might embrace all of Alaska's coal lands a campaign was entered upon, looking to the confiscation of the rights of Alaskan coal claimants who had invested their money in an effort to develop the coal mines in accordance with the then existing Land Office regulations. This was accomplished and the Alaska Coal Leasing Act has now been the law for two years. No leases have been granted

and no coal has been mined under its provisions. Those who are familiar with coal mining operation have no hope that any substantial development will ever take place under its requirements.

It is believed that leases will be applied for by those who know how to make money, by selling stock, whether the mining of coal can become profitable under its provision or not.

Ten years of "our whole conservation policy" in Alaska has resulted in the abandonment of the work already in progress at the beginning of this period and the complete tying up of Alaska's coal resources.

Mr. Lane has undertaken to deal with a practical problem in a practical way. He has failed in the trust which Mr. Pinchot (?) conferred, and is advocating the home rule principle for Alaska control, a principle which is the bulwark of our government. If Mr. Lane can effectually destroy the policies which have thus hampered Alaska's development, he will win the enthusiastic approval of all Alaskans and the commendation of all other patriotic American citizens who have any knowledge of Alaskan conditions.

#### COAL INDUSTRY'S BIG PROBLEMS OUTLINED

What the coal industry needs is to sell its output at a price which leaves a profit after all the costs of operation, depreciation and exhaustion are provided for. This must be accomplished either by reducing the cost of production, reducing the cost of distribution, or by securing a better price in the market.

The competition created by the ability of coal operators to produce 50 per cent more coal than the markets can possibly consume, and the necessity of a large production (in order that the overhead charges may be reduced to the minimum) create a condition which necessarily destroys markets and will continue to do so until some comprehensive plan of co-operation can be made effective.

This leads to the conclusion that some form of combination between coal operators is absolutely essential to the profitable conduct of the business. Should

this condition be brought about the coal industry must next face the possibility that a stronger and more compact organization, which already absorbs 75 per cent of the market price of the coal, would immediately demand a share of these profits, and judging from the past the share demanded would be 100 per cent.

A provision of the Clayton bill gives authority for combinations of organized labor which it forbids the operators. It would therefore seem desirable that this law should be so amended that the same authority which supervises the combinations of operators for the betterment of their business should also supervise the labor organizations, and permit them to act in combination only when its acts are not too greatly subversive of the public interest.

It would seem that a campaign should be inaugurated for any such additional authority to go to the Federal Trade Commission so as to permit it to supervise and control all organization whether of labor or capital, which undertakes by co-operative means to better its conditions.

It also seems that a campaign should be inaugurated to repeal that part of the Clayton bill which legalizes those acts of labor which otherwise would be a violation of the Sherman law. A requirement should be made for such a system of cost accounting as will show the exact condition of the coal mining industry.

A strengthening of the Federal Trade Commission is also very desirable.

If these things are accomplished it will even then be difficult for coal operators to act together in such a way as to put the business upon a sound financial basis.

Such interesting questions as these are to be discussed at the nineteenth annual convention to be held at Chicago, November 13-16.

#### COOPERATION MAKES EXACT STATISTICS POSSIBLE

Evidence is plentiful at the Geological Survey that the cordial cooperation given by the mine, smelter and quarry operators of the country, in enabling the Survey to compile a semi-annual review of the

mining industries, is appreciated very highly.

The magnitude and present activities of the mining and quarrying industries are probably not yet fully appreciated by the public. The mining industry has suffered greatly in the past from the lack of publicity and even at present is receiving less publicity than any important industry in the country despite the spectacular features characterizing mining enterprises at this time.

There was a time when many mining and smelting companies objected very strenuously to any form of publicity. That this has changed almost entirely is shown by the cordial way in which mine and smelter operators contribute information to the United States Geological Survey. They now realize the advantage of having figures and facts go to the public through an impartial agency which gathers them intelligently and with scrupulous care.

#### COMPULSORY ARBITRATION

The distinction between civilized government and barbarism is largely a difference in the methods employed in the settlement of disputes.

In modern governments the rule is that those who undertake to settle their controversies by personal force, are regarded as criminals, and if convicted by the courts, are subject to punishment.

The exception to this rule has been the disputes between employer and employee, which subject to the requirements for the preservation of law and order, have been settled by a form of force almost as effective as the force of arms.

In some instances where this power has not been able to accomplish its purpose, violence has been resorted to.

When industrial conflicts concern only the parties involved and are carried on without violating the laws, it would seem that the public had no right to demand a different method of settlement; but when these disputes affect the general public more vitally than the contestants there would seem to be many reasons why the public interest justifies

interference in behalf of the people as a whole.

The present railroad situation seems to point out more clearly than ever before the necessity of some form of adjudication of disputes between individuals which affect the public as a whole as well as the parties involved.

It would seem that our civilization is incomplete until it has provided for the settlement of group differences by rules similar to those which prevail in the adjudication of private disputes.

The state punishes the individual who by might or stealth undertakes to secure redress for his grievance. Disputes between groups of individuals are much more dangerous to the public peace and frequently concern the public at large in a much more vital manner than private disputes.

The public has a right to protect itself against the inconveniences and loss occasioned by a stoppage of traffic. The public has a right to be heard on the question of increased costs of transportation which, in the end, it must assume and pay. The cost of living is already burdensome. A considerable part of that cost is transportation. It is estimated that the produce for which the consumer pays one dollar nets the producer thirty-five cents, while sixty-five cents pays the cost of transportation and distribution. The public as a whole is entitled to be heard, and subject to the rights of humanity on the one side and property rights on the other, should absolutely control this and similar situations.

The public protects itself against lawlessness by establishing courts and court agencies through which crime may be prevented or punished. That same public has an equal right—more than that it is charged with the composite duty—to protect its individual parts against injustice and oppression, both of which are involved in every great industrial contest.

#### PATENT LAWS BAD; INVENTORS SUFFER

Various laws on the statute books are urgently in need of revision. This applies to the mining law perhaps more than

to any other, but the laws governing the granting of patents well may be placed in the same category. This has been shown very clearly as a result of the negotiations surrounding the patenting of the Rittman process for making gasoline. While it may be that Mr. Rittman's process was peculiarly a target for rival claimants due to the fact that his discovery is being patented by the government, the fact remains that despite every effort to settle the controversies which have arisen in regard to distilling methods, nearly a year has passed and the matter is in a worse jumble than ever.

#### LEGISLATION NECESSARY TO HELP JOPLIN

National legislation undoubtedly will be required to stabilize conditions in the Joplin zinc producing district. It is necessary to the welfare of this mining region to have the right to form such combinations as will enable the marketing of the product in a business-like way. As it is, the producers are forced to accept any offer which may be made by one of a number of purchasers acting under a gentlemen's agreement. It is also necessary to the success of the Joplin district that a tariff be levied against the importation of zinc ores. This duty must be sufficient to cover the difference in cost of production here and abroad as determined by the relative labor cost.

#### WYOMING ONLY STATE NOT USING FOUNDRY COKE

Coke for foundry purposes was consumed in every State except Wyoming, in 1915, the Geological Survey has ascertained. The principal use of foundry coke is in the cupola for melting pig iron and scrap for castings, although it is used to a small extent for melting the non-ferrous metals.

#### Inspect Safety First Train

Salt Lake City, August 25.—The government "Safety First" train was at Salt Lake City August 19 to 21, remaining open to the public from 1 to 9 p. m., August 19 and 21. Eight thousand persons visited the train.

## COLORADO AND UTAH ARE DESTINED TO BECOME GREAT CENTERS OF OIL PRODUCTION

**Hydrocarbon Shales Now Being Carefully Investigated by United States Geological Survey—Work in Field During Past Month Develops Fact that Shales Cover Much Greater Area Than Was Supposed**

The field investigation and mapping of the hydrocarbon shales in northeastern Utah, to which reference was made in the last issue of the JOURNAL (page 358), have been carried westward by D. E. Winchester of the Geological Survey in charge of the work. He reports the existence of oil shale deposits over a considerable area in northeastern Utah. Mr. Winchester's work for the Geological Survey promises to increase materially the estimates made previously by the Survey as to the oil and gasoline reserves represented by these invaluable deposits. According to the published survey there is estimated to be about 20,000,000,000 barrels of oil, from which 2,000,000,000 barrels of gasoline can be extracted (by the old methods), obtainable from the shale beds 3 feet or more in thickness and which run 25 gallons or more to the ton in Northwestern Colorado alone.

These hydro-carbon deposits are not deposits of shale which have been saturated or impregnated with oil, but are sedimentary deposits made up of organic detrital material somewhat similar in origin and nature to cannel coals. The oil is obtained by destructive distillation, roasting, which breaks up the organic combination in the shale. The volatile matter is driven off as gas, a large portion of which on cooling condenses to form oil similar to the lower grades of petroleum obtained from the Gulf Coast and the California fields. Some of the shale deposits will yield over 50 gallons of oil to the ton of shale.

According to this calculation, Colorado alone appears to contain in these oil shales more than twice as much petroleum as, according to the current estimate, now remains both in the discovered and in the possible oil pools of the United States. The latest estimate, that furnished by the Survey for the use of the Secretary of the Interior in his reply to a Senate resolution (Senate document 310—64th Congress, Second Session), names 7,629,000,000 barrels as the reserve of oil remaining in the oil fields of the United States. It must be remembered, however, that such estimates are, after all, only mere scientific guesses based upon the best and most comprehensive information available and are subject to great error on account of the vague and indeterminate elements conditioning the calculation.

The importance of the oil resources locked up in the hydro-carbon shales of northwestern Colorado and northeastern Utah will be better realized when it is remembered that the total production of petroleum in the United States from the beginning of the industry to date amounts to something over 3,500,000,000 barrels.

There is hardly room for doubt that this invaluable and relatively inexhaustible deposit will be utilized sooner or later, possibly very soon, it may be almost immediately. Colorado and Utah will perhaps loom up eventually as great centers of oil production in the United States.

Another important feature with regard to the oil shale deposits is the fact that they have considerable contents of nitrate. One of the by-products of the distillation of these shales will be nitrate. In view of the desirability of the United States having a supply of nitrates within its own borders, the by-product development will be second only in importance to the petroleum output.

### MATANUSKA COAL BROUGHT TO TIDEWATER BY RAILROAD

The Government's Alaskan railroad is now carrying coal from the famous Matanuska coal fields, to tidewater at Anchorage, a distance of 71 miles, says a statement from Secretary Lane. The first coal was loaded into a train of cars on Wednesday afternoon, August 16, and was taken from the Doherty mine at Moose Creek.

"The importance of this event was evidently appreciated by the pioneers in the Territory," continues Mr. Lane, "for there was a large crowd of men, women and children on the scene when the loading of the coal from the bunkers to the cars was begun. A special train, that had been chartered by the Anchorage Chamber of Commerce, carried an enthusiastic party of citizens from that city and vicinity. Chairman William C. Edes and Lieut. Mears, of the Alaskan Engineering Commission, which is in charge of the construction of the railroad, were also in attendance, as was Bishop Rowe, of Alaska.

"The honor of dumping the first carload of coal from the bunkers to the train, was enjoyed by Miss Babe White, of Anchorage, who also has the distinction of having driven the first spike on the railroad. The incident was accompanied by the enthusiastic and vociferous cheering of the assembled multitude. No untoward incident marred the event, and there was a general expression of satisfaction that the Government's railroad had so successfully entered the coal fields at a much earlier date than had been expected.

"The opening of these coal fields is regarded as a most important valuable benefit to both Alaska and the Pacific Northwest. It means cheaper fuel for that general country, and it is confidently predicted that it will be followed by new industrial and mining expansion."

## Latest Mining Patents

Apparatus for use in connection with the distillation of petroleum and products therefrom. No. 1,192,889. This invention is by John L. Gray, of Webster Groves, Mo.

The object of the invention is to produce, from one heating of the crude material, any desired number of the constituents of the crude material as isolated segregations, having as closely as possible fixed densities and boiling points. To this end the condenser of this invention comprises a sufficient number of units or sections to condense all the material it is desired to separate. There may be as many products as there are sections. Each product may be taken from the section in which it is condensed, or but few products may be taken from the condenser. These units are preferably vertically arranged, and through them the compound vapor will consecutively flow. Each unit embodies an air cooled tubular condenser, a chamber beneath it and a condensate collecting trough in the chamber into which the condensate formed in the tubes will fall.

Method of extracting gold. No. 1,193,197. This invention is by Albert W. Smith, of Cleveland, Ohio.

The object of the invention is to provide a process whereby the formation of the deleterious compounds may be prevented without directly affecting in any way the action of the cyanide, the greater part of the oxygen for the reaction of the cyanide with the gold being preferably secured by agitating the solution in air as heretofore.

Sealing Plug for Oil Wells. No. 1,194,764. This invention is by David C. Miller, of Tulsa, Okla.

This invention relates to a sealing plug for oil wells and more particularly to a device of this character which may be lowered into the oil well casing or tubing, whereby the bottom of the casing or tubing may be sealed and closed for preventing the inlet of water in wells which have penetrated to such a depth that water tends to enter the well and thereby prevent the proper working of the well.

Ore Concentrator. No. 1,194,477. This invention is by Louis David Chevalier and Henry Charles Reche, of Dubuque, Iowa.

This invention relates to improvements in apparatus for concentrating ore, and the object of the improvement is to furnish a device which shall effectively separate the heavier from the lighter ingredients of comminuted ore by the action of mechanical agitation thereof accompanied by the differential move-

ments imparted thereto caused by the employment of air currents moving in various directions. The apparatus may be used to separate any heavy components from lighter materials in a mixture, such as coal from stony particles, or the like, as well as ore.

Method of Mining Coal. No. 1,194,298. This invention is by Harry A. Kuhn, of Pittsburgh, Pa.

This invention relates to a method of mining coal. The object of the invention is to provide a method of mining coal by means of which the coal, after it has been undercut and shot, may be readily and quickly removed without involving the risk of loss of life, and at the same time dispensing with the digging of the coal by means of picks, as in the method now commonly employed. To this end the invention consists in making a cut or undercut in the solid wall of coal and expanding the coal along its lines of cleavage, substantially filling the space thus provided by the cut or undercut, the coal settling down where an undercut is made on the floor formed by the undercut, or swelling into the cut wherever made, finally undermining the coal along the line of the original cut, and at the same time conveying it to the point of loading.

Process of Extracting Gasoline from Natural Gas. No. 1,195,158. This invention is by Joseph P. Foucart, of Muskogee, Okla.

This invention relates to the extraction of gasoline from natural gas from oil wells, commonly known as "casing-head gas," said gas being more or less saturated with gasoline particles and heavy hydrocarbons which under prevailing practices are separated from the gas by condensation under low temperatures and high pressure, thereby producing a high gravity gasoline. This is subsequently converted into commercial gasoline by mixing the same with the residue of refineries or low gravity naphtha. This improvement contemplates the extraction of commercial gasoline from the aforesaid casing-head gas under conditions of high temperature and comparatively low pressure and by proper control of said conditions a gasoline of any desired gravity within certain limits may be obtained, whereby subsequent treatment by reduction or mixture with low grade gasoline or naphtha is dispensed with. The product under this process may be used for all industrial, domestic, and other purposes as it comes from the plant, thereby saving the expense of transportation to reducing plants for further treatment as is now generally the case.

Recovery of Zinc. No. 1,193,680. This invention is by Charles H. Fulton, of Cleveland, Ohio, assignor to David B. Jones, of Chicago, Ill.

The primary object of the invention is the recovery of an increased percentage of the zinc content of the ore, either in the form of spelter or in the form of zinc oxid, although other advantages flow from this invention. The object and advantages of this invention are obtained by mixing the ore and the reduction agent and a binding material in certain proportions, forming the mixture into briquets under a high pressure, subjecting the briquets to a preliminary heating and drying operation under certain prescribed conditions and subsequently subjecting them to treatment in a distillation furnace for the recovery of their zinc content either in the form of spelter or zinc oxid as may be desired.

#### **AMERICAN INSTITUTE OF MINING ENGINEERS TO MEET IN ARIZONA**

The American Institute of Mining Engineers will meet in Arizona the week of September 18. Sessions will be held in the principal mining centers of the state, the members traveling between the various points by special train and automobile.

Some indications of the importance of this meeting to mining engineers in various sections of the country is shown by the fact that a special train has been arranged for to carry eastern members from New York City on September 14. Other members and their guests will join the party at various points en route and at El Paso, Tex., the western section of the convening members, starting from Los Angeles, Cal., will meet the train and continue to Arizona.

The company plants that will be visited are as follows: At Hurley, the mines and works of the Chino Copper Co.; at Bisbee and Douglas, the mines and works of Copper Queen Consolidated Mining Co., Calumet and Arizona Copper Co., and Shattuck Copper Co., at the Globe district, mines and works of Inspiration Consolidated Copper Co., Miami Copper Co., Old Dominion Copper Mining and Smelting Co., together with the new works of the International Smelting Co.

The institute now comprises more than 5,600 members.

#### **RAILROAD FOR OATMAN DISTRICT PLANNED, IT IS SAID**

It is reported in Washington on good authority that the Atchison, Topeka & Santa Fe Railroad is contemplating seriously the building of a line from Topock to Oatman, Ariz. The advantages of railroad transportation to the Tom Reed-Gold Road district will have an important bearing on the development in that region.

#### **BUREAU OF MINES DOES GOOD WORK AT EXPLOSION**

By hurrying a number of its experts to Cleveland immediately following the explosion in the tunnel being run under the lake at that point, the Bureau of Mines was able to do efficient safety work and offer valuable suggestions for the prevention of similar accidents. It is the opinion of George S. Rice, chief mining engineer of the Bureau of Mines, who personally visited the scene of the explosion, that the gas which caused the explosion came from a pocket in the glacial clay in which the tunnel is being driven. He recognizes, however, the possibility that the explosion may have been caused by natural gas which had worked its way up into the clay. Natural gas has been found under the city of Cleveland. It is regarded as more probable, however, that the gas came from the decaying of carbonaceous material in the glacial matter.

An interesting feature of the investigation was the development that the men working on the tunnel believed they could smell gas and were relying on their olfactory nerves to warn them of the presence of dangerous gases. They were very much surprised to learn that the more dangerous mine gases have no odor.

The Bureau experts were not able to ascertain exactly the cause of the explosion but indications point to the fact that the gas was ignited by a spark from a motor which was in operation near the face of the tunnel. There is a possibility that the explosion may have been caused by the breaking of an incandescent lamp as a broken lamp was found near the center of the explosion.

As a result of the investigation the Bureau of Mines recommended to the city officials that "permissible" electric cap and hand lamps be used just as would be done in gaseous coal mines and that all electric wires be removed in that part of the tunnel which would be exposed to sudden bursts of gas, that is, between the air lock end the face of the tunnel. The air lock, behind which 32 pounds pressure per square inch was maintained, making ordinary ventilating methods difficult to use. At the suggestion of the Bureau of Mines, better ventilation was provided by the installation of an overhead gas-collecting funnel and return pipe running through the airlock and up the shaft to the open air. It was also recommended that compressed air be used instead of electricity for haulage engines and other machinery.

The Secretary of War, whose home is in Cleveland, has taken an active personal interest in the investigation and at his request the Bureau of Mines has released one of its most efficient gas inspectors, who has been employed in the tunnel. The driving of the tunnel has been resumed. The accident resulted in the death of twenty-two men in the original accident and attempted rescue work, before the arrival of the bureau crews with oxygen mine rescue apparatus.

## BUREAU OF MINES SHOULD PASS UPON ALL GOVERNMENT FUEL, EXPERTS DECLARE

Committee on Mines and Mining Considers Dr. Foster's Bill Which is Intended to Bring About Greater Efficiency in Purchases of Coal and Other Fuels—Van. H. Manning Testifies

The imperative need of more intelligent purchases of coal for government use was set forth by Van H. Manning, Director of the Bureau of Mines, before the Committee on Mines and Mining. The hearing was on H. R. 10930, the bill introduced by the chairman of the committee, Dr. Martin D. Foster. It provides for the uniform selection and purchase of fuel. Following is a portion of the testimony of Mr. Manning before the committee:

The annual coal purchases of the Government amount to between \$7,000,000 and \$8,000,000. This fuel is selected and used sometimes in the most satisfactory manner, but frequently in ways inefficient and wasteful. The supervision of its use is sometimes expert, but is often far from satisfactory, so that engineers competent to judge are of the opinion that the practices of the Government in the economical use of its fuel are open to improvements of the same order of magnitude as have been realized by many large users of fuel when centralized, persistent effort has been made to reduce fuel costs. A saving as moderate as 10 per cent, which is believed to be well within a reasonable expectation, indicates the magnitude of the sum involved. There is at present waste in the selection of fuels, waste due to inefficient design of equipment and waste in the manipulation of fires. There is a lack of expert instruction given to the man firing the fuel, a frequent lack of information by plant managers as to what other plants are attaining, and a lack of knowledge of standards by which to measure actual performance.

The Navy Department is the largest purchaser of coal, its yearly requirements being approximately 1,000,000 tons, costing approximately \$3,000,000, of which about 750,000 tons are for delivery to ships, the balance being required at navy yards, stations, and other land establishments in the United States.

The next largest is the War Department, in which the Office of the Quartermaster General of the Army purchases each year for use at Army posts in the United States approximately 265,000 tons of coal, costing about \$1,500,000. Many of these posts are not using the most economical fuels available, some purchasing anthracite coal, for instance, at high prices when bituminous coal of good quality is available. Selecting about

25 posts out of 100, or so, of the larger ones, a study indicates that by a change from high-priced anthracite to bituminous coal, a saving of at least \$86,000 per year could be realized. This is but a small part of the total saving that could be made by all of the posts by the selection of the most economical fuels following a careful study of the fuels available in different parts of the country and of the adaptation of the furnace equipment at the posts to the use of the cheaper local fuels.

Many of the posts in the West are located on land-grant railroads, and by the intelligent selection of fuels at many of the posts as regards the most advantageous land-grant freight rates that could be obtained, a further saving of many thousands of dollars per year could be effected, it being estimated that had the coal requirements of the posts and transports in the San Francisco district for the current fiscal year been purchased for delivery at Portland, Ore., and then shipped to destination via land-grant roads, that a saving of approximately \$40,000 could have been made.

During the present fiscal year, the Indian Office, which purchases annually approximately 38,000 tons of bituminous and 5,000 tons of anthracite coal, has been giving consideration to reducing fuel costs. High-priced anthracite coals are being replaced by suitable or available bituminous coals.

The Bureau of Mines has been able to attack the fuel problems of the Government in but a very small way, because of its restricted authority and limited funds available. It has been restricted practically to making investigations only when so requested by the other bureaus or departments of the service.

The Bureau of Mines has, however, promulgated the purchase of coal on the quality or specification basis. During the present fiscal year the total estimated amount of coal so purchased and to be paid for on the basis of analyses of samples by the Bureau of Mines is 1,340,000 tons, costing approximately \$4,070,000. As indicating the advantage of such a method of purchasing coal, the War Department reported that in the fiscal year 1911-12, a saving was realized of \$27,561 on coal contracts amounting to 265,372 tons, costing at contract prices \$1,582,721.

The greatest saving that has come to the attention of the Bureau of Mines as a result of the use of the specification method was that obtained on contracts of the Panama Railroad Co. during the fiscal years 1910-11 and 1911-12. A net saving of \$73,510 resulted from deductions in price account of the delivery by the contractor of coal lower in quality than guaranteed. This saving was on contracts amounting to approximately 1,142,800 tons, costing \$2,963,000.

The Bureau of Mines has been able to make but a few investigations of the fuel problems in some of the local plants in the District of Columbia, such investigations being made upon specific requests, and the following illustrates the advantages that have resulted.

A saving of approximately 12,200, or 22 per cent per year, in the Government Printing Office plant has been realized as the result of a change to bituminous and a steam size of anthracite from anthracite egg coal, which formerly cost about \$53,500 per year.

A saving of approximately \$2,700, or 18 per cent, per year, in the Land Office plant has been realized as the result of a change to bituminous from anthracite coal, which formerly cost about \$15,000 per year.

A saving of approximately \$19,000, or 59 per cent per year, in the State, War, and Navy Building plant resulted from the substitution of bituminous and anthracite buckwheat for anthracite furnace coal, which formerly cost about \$32,000 per year, and from the centralization of heating and power in one plant.

Tests recently made at the Bryant Street pumping station indicate that a saving can be made of about \$2,400 per year in the more efficient utilization of the fuel.

While the late Director of the Bureau of Mines was recuperating at Fort Bayard, N. Mex., he became acquainted with an engineer from the Quartermaster General's Office, who was detailed at Fort Bayard for the purpose of determining the reasons for the excessive fuel consumption in the power plant and for heating purposes. It appears that before the engineer arrived, the plant was smoking almost constantly, but the experienced engineer was able to instruct the firemen in the proper use of the coal, without making any change in the equipment, with the result that practically all of the smoke was eliminated and the evaporation of water per pound of coal was increased almost 100 per cent. Within a short time, however, after this engineer visited the fort, the methods of handling the coal had again become lax and the power plant belched forth smoke about as before, indicating the necessity of constant supervision of the operation of Government power plants. Further, it was determined that at the time of the engineer's visit, bituminous coal costing about \$7.20 per ton could be satisfactorily used for heating purposes in place of anthracite coal

costing at that time over \$13 per ton, but so far as is known, the cheaper fuel has not been utilized.

So far as the Bureau of Mines is informed the War Department has only one engineer who has made a special study of the selection, handling, and use of fuels, his time being largely taken up with the matter of power plant design and he is able to give only a part of his time to the question of the economical selection and use of fuel. It is readily apparent, therefore, that this important question of the study of the selection and use of coal by the War Department cannot be efficiently and adequately prosecuted under the present conditions.

To obtain the best results in the selection and utilization of fuel for the various departments the investigations should be under one office, so that a universal supervision of Government fuel requirements would obtain. The War Department, Treasury Department, Navy Department, and others have engineers who are all endeavoring to cover, in more or less degree, work of similar character, and their lines of travel throughout the United States frequently cross and recross.

Nearly every branch of the Federal Government is at the present time buying fuel for New York Harbor delivery, and each office is working entirely independent of the other. By centralizing such purchases a material saving to the Government would undoubtedly result.

#### Buyers of Manganese Ores

The principal purchasers of manganese ores are as follows: N. A. Adler, Batesville, Ark.; Alleghany Ore & Iron Co., Iron Gate, Va.; American Carbon & Battery Co., E. St. Louis, Ill.; American Manganese Mfg. Co., Dunbar, Pa.; American Smelting & Refining Co., Murray, Utah; American Steel Foundries, Pittsburgh, Pa.; Burney & Smith, New York, N. Y.; Carnegie Steel Co., Pittsburgh, Pa.; Delaware River Steel Co., Chester, Pa.; Eureka Manganese Co., Birmingham, Ala.; Robert Gilchrist, Elizabethtown, N. J.; Harshaw, Fuller & Goodwin Co., Cleveland, Ohio; Hickman Williams & Co., St. Louis, Mo.; Illinois Glass Co., Alton, Ill.; Illinois Pacific Glass Co., San Francisco, Cal.; J. S. Lawson & Bro., Inc., 80 Maiden Lane, N. Y.; Manhattan Electrical Supply Co., New York, N. Y.; Napier Iron Works, Napier, Tenn.; National Alloys Co., Philadelphia, Pa.; National Paint & Manganese Co., Lynchburg, Va.; Noble Electric Steel Co., Heroult, Cal.; Pulaski Iron Co., Pulaski, Va.; Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.; U. S. Steel Corporation, Pittsburgh, Pa.; U. S. Steel Corporation, South Chicago, Ill.; U. S. Steel Corporation, Birmingham, Ala.

**PROMONTORY DISTRICT OF  
UTAH SUBJECT OF REPORT**

A spectacular occurrence in mining was the discovery of important copper property in the Promontory region of Utah. A deposit of great richness, which cropped on the surface, lay until recently in a frequently traversed region without discovery. It is only two miles from the railroad. When work was started on it profits were taken out from the grass roots.

The men who undertook the work began with no capital and during the first year the company paid \$100,000.00 in dividends.

Some interesting facts with regard to the geology of the Promontory district have been brought out by a report by the Geological Survey written by B. S. Butler and V. C. Heikes. Mr. Butler specializes on copper and is regarded as one of the best posted men in the United States on this metal. Mr. Heikes is in charge of precious metals and semi-precious metals of the states of Utah, Arizona, Nevada and Montana.

While the data on the Promontory district was compiled during a hurried visit there is increasing demand for just such information. It doubtless would be years before the importance of such a district would justify a detailed examination. Such a report as just has been issued, however, required little time and expense and still is of great service. An increasing number of such reports are to be issued it is understood.

As to the history of production in the Promontory district the report referred to says:

Prospecting in the range up to the time of visit had been largely confined to two localities, both near the southwest side of the promontory. There has been some prospecting of copper deposits in the quartzite series on the west side of the promontory about 1½ miles northwest of Saline over a period of several years. In 1907 14 tons of hand-sorted ore, averaging 3.85 per cent of copper and 1 ounce of silver to the ton, was shipped. The present activity is confined largely to the zinc-lead deposits. The history of these deposits is given by S. S. Arentz as follows:

For several years previous to 1915 a coterie of Ogden men, headed by Mr. James Wortherspoon, Lorenzo Farr, John Farr, and Mr. Carlson, held two groups of placer claims covering a bed of marbleized limestone, and also a large portion of what is now the Lake View Mining Co.'s property. This placer property was held by location over a period of some five years; the amount of work done was almost negligible. December, 1914, several men, headed by I. F. Farr, were employed to work on this placer property on the marble outcrop, about 1 mile north of the Judge Henderson wheat field. During noons and Sundays the workmen walked up the wash to the limestone beds outcropping above. Boulders of lead-zinc carbonate were discov-

ered in the talus and traced to the outcrop of ore in place found at the top of the 100-foot bed of limestone, forming the so-called middle bed in contact with shale. Four locations were then made.

The average of the ore is said to be as follows:

Lead .....	7.7
Iron .....	1.1
Silver .....	.2
Gold .....	Trace
Zinc .....	32.75
Sulphur .....	.2
Moisture .....	1.9
Insoluble .....	16.0

**ZINC AND LEAD DEPOSITS**

Prospecting of zinc and lead deposits at the time of visit had been confined almost entirely to the "middle" limestone bed. As noted in the discussion of the geology, this is a limestone bed 50 to 75 feet in thickness included in members composed prevailingly of shale. The ores have been formed by replacement of this limestone near the north-south fissures. The largest deposits thus far disclosed occur just beneath the overlying shale, though developments have shown that considerable mineralization has taken place at lower horizons in the ore-bearing limestone. The ores are entirely oxidized, consisting of zinc and lead carbonates and a little hydrous iron oxide and manganese oxide. The gangue consists mainly of unplaced limestone with some quartz.

As the writers' observations were confined to very shallow developments, it is not possible to make any generalizations concerning the relations of the ores. The carbonate ores were undoubtedly derived from the alteration of sulphides, though no sulphide was observed.

It has been found a pretty general rule that in the oxidation of mixed lead and zinc sulphides in limestone the oxidized lead ores occupy essentially the position of the original sulphides and the zinc ores have formed beneath the original sulphide bodies. The zinc sulphate produced by the oxidation of the sulphides has passed into the underlying limestone, with which it has reacted to form the zinc carbonate. The chemistry of this process has been discussed in the papers cited and need not be set forth here.

In the Promontory district, so far as developments show, zinc is far more abundant than lead, and it is possible that this was true in the sulphide bodies. The relation of the zinc and lead ores in some places corresponds to that found in other districts, namely, the zinc lies below the lead; but there are other places where this does not appear to be the case. A determination of the general relations must await further developments. Mr. Arentz has pointed out that from the crests of the spurs, through which the ore bed passes, toward the canyon bottoms there is a progressive decrease in the content of zinc and an increase in lead.

Prospecting has been carried on along the outcrop of the "middle bed" for a distance of about 4,500 feet, and lodes of ore are shown in numerous openings. In the development of the property the managers seem to have followed the conservative policy of determining the amount and character of the mineralization along the outcrop before beginning extensive developments at depth, and at the time of visit the ore zone had nowhere been exposed more than a few feet below the surface. Sufficient data concerning the mineralization had been obtained, however, to warrant the planning of deeper development work. The region is one of considerable relief and suited to the development of the ore bed for several hundred feet below its highest outcrop by means of tunnels. Practically no work has been done on the lower limestone, though it is said to contain as much as 3½ per cent of zinc on the outcrop.

#### COPPER DEPOSITS

The copper prospects of the Promontory district are about 1½ miles northwest of Saline station. The deposits crop out on the crest of a ridge near the shore of the lake. The country rock is the quartzite near the base of the exposed sedimentary rocks of the south end of the range. The beds at this point strike N. 45°-50° E. and dip 16°-20° SE. The ore is disseminated in the quartzite. The primary mineralization formed chalcopyrite and possibly bornite, but at the surface the sulphides have been altered to carbonates.

The developments consist of two shafts about 200 yards apart, sunk from the crest of the ridge. One of these has a depth of about 50 feet, the other of 120 feet. At a lower point an inclined shaft was sunk on a westerly pitch nearly at right angles to the dip of the beds to a depth of 80 feet. Near the same point a tunnel has been driven eastward for about 100 feet. At a point near the shore of Great Salt Lake and about 200 feet vertically below this tunnel another tunnel has been driven eastward for 452 feet. This was projected to intersect the downward extension of the ledge that crops out on the ridge.

Some mineralized rock was observed in the prospect openings, and it is said that more valuable ore was encountered at some points which were not accessible at the time of visit. The ore shipped was obtained from large blocks of mineralized quartzite at the surface. These blocks measured from 15 to 50 feet in thickness.

#### Invitation Extended to Institute

Through the kindness of the officials of the American Institute of Mining Engineers, members of that body will be advised of the invitation extended to them by the American Mining Congress to attend the 19th annual convention which is to be held in Chicago, November 13 to 16.

#### GOVERNMENT SPECIALISTS HAVE AN EXPERIENCE MEETING

In a conference participated in by thirty-five mining engineers, mine rescue and first aid men of the Bureau of Mines, at Pittsburgh, from August 15 to August 26, much general information was brought out by a general interchange of views. Each one of those called to the conference outlined the work he has been handling for the past year. Each man had carefully prepared for the occasion and was able to give a concise statement of his work setting forth the more important developments as well as the problems which have not been solved satisfactorily. George S. Rice, chief mining engineer of the Bureau of Mines and H. M. Wolfkin, engineer in charge of the mine safety work, presided. After each paper general discussion was held.

#### BUREAU OF MINES TO AID WITH CALIFORNIA FIELD MEET

The Second Annual California Field Meet for Miners will be held September 6 under the auspices of the California Metal Producers' Association. This organization will be assisted by the Bureau of Mines and the Industrial Accident Commission of California. Edward Higgins will represent the Bureau of Mines at the meet.

Robert I. Kerr, secretary of the Metal Producers' Association, is chairman of the committee having charge of the meet. John R. Brownell, superintendent of Safety of the California Industrial Accident Commission, is the other director of the meet.

#### COMMENTS ON ARIZONA'S RISE AS COPPER PRODUCING STATE

In connection with the announcement that the next meeting of the American Institute of Mining Engineers is to be held in Arizona, an official of the organization makes the following statement:

"A few years ago Arizona stood third in the copper-producing districts of the United States. Since that time, with the development of porphyry mines, the output has gone up with great rapidity until it not only is the leading district, but its output at the present time is at the rate of nearly double the Montana output, which now stands second in the list."

#### To Confer on Oil Development

A conference with regard to the development of fuel oil for the Navy will be held September 10, between Director Manning of the Bureau of Mines, William A. Williams, petroleum technologist of the Bureau and Dr. D. T. Day, a consulting petroleum expert of the Bureau, with the Fuel Oil Board of the Navy Department.

## TWELVE WESTERN STATES CONTAIN MORE THAN 250,000,000 ACRES OF PUBLIC LAND

Nevada With 55,375,077 Acres, Leads Other States—In Colorado Over 2,500,000 Acres Were Taken Up During Last Fiscal Year—California Has Over 20,000,000 Acres of Vacant Land

Uncle Sam still has considerable land to give to the enterprising citizen, man or woman, who wishes to establish a home. Secretary of the Interior Lane announces that more than a quarter of a billion acres of land remain in the public domain, according to official figures, just compiled by the General Land Office. These acres are located in twenty-five different states, extending from California to Michigan, from Florida to Washington. All but 2,290,000 acres of it is in the Far West, with Nevada containing the highest acreage, 55,375,077. An even dozen of the extreme western states alone hold more than 250,000,000 acres. The exact amount of land that is unreserved and unappropriated, according to the official figures, is 254,945,589 acres. Of this amount, approximately 92,000,000 acres are unsurveyed.

Missouri reports the least area of vacant land, having but 952 acres, which are scattered over 16 counties. Alabama has 42,680 acres in 51 counties; Florida 135,237 acres in 45 counties, Mississippi 30,374 acres in 58 counties, and Louisiana 44,804 acres in 57 counties.

In 52 counties of Michigan may be found 90,540 acres, while 30 counties in Wisconsin report 5,872 acres.

Of the Pacific States, California has 20,025,999 acres of vacant land; Oregon 15,337,809, and Washington, 1,132,571.

Large areas of vacant land are reported in the Southwestern States, as follows: Arizona, 23,597,219; Nevada, 55,375,077; New Mexico, 26,338,379; Utah, 32,968,837.

The land in the Dakotas is rapidly passing into private ownership, only 2,382,588 acres of vacant land being reported in South Dakota, and 381,199 acres in North Dakota.

Of the Northwestern States, Idaho contains 15,510,561 acres of vacant land, of which 6,679,071 acres are unsurveyed; Montana, 16,649,725 acres with 7,420,071 unsurveyed; and Wyoming 28,528,492 acres with 1,960,752 acres unsurveyed.

Kansas' vacant area is reported as 56,018 acres, while Nebraska contains 146,256 acres.

In Colorado, over two and a quarter million acres were appropriated during the last fiscal year, leaving 14,908,127 acres now vacant. Of this area, over 2,000,000 acres are unsurveyed.

The total area of unappropriated land, sur-

veyed and unsurveyed, in the twenty-five public-land states, is reported as follows:

Alabama .....	42,680
Arizona .....	23,597,219
Arkansas .....	402,219
California .....	20,025,999
Colorado .....	14,908,127
Florida .....	135,237
Idaho .....	15,510,561
Kansas .....	56,018
Louisiana .....	44,804
Michigan .....	90,540
Minnesota .....	798,804
Mississippi .....	30,374
Missouri .....	952
Montana .....	16,649,725
Nebraska .....	146,256
Nevada .....	55,375,077
New Mexico .....	26,338,379
North Dakota .....	381,199
Oklahoma .....	55,250
Oregon .....	15,337,809
South Dakota .....	2,382,588
Utah .....	32,968,837
Washington .....	1,132,571
Wisconsin .....	5,872
Wyoming .....	28,528,492
Total .....	254,945,589

### GLOW ON FACE AND HANDS OF NIGHT WATCHES EXPLAINED

The compounds used on the faces and hands of radium or night watches, now offered on the market, are of two kinds: (1) a mixture of artificial hexagonal zinc sulphide containing a very minute quantity of a radium salt, and (2) a mixture of calcium sulphide and other sulphides.

The radium preparations are much the better and owe their light-giving properties to the fact that artificial hexagonal zinc sulphide glows when bombarded by the alpha radiations given off by the radium. The alpha radiations consist of helium atoms. The radium preparations can be told from the sulphide preparations by examining in the dark with a lens. If the preparation contain radium the dancing light made by the striking of the helium atoms on the zinc sulphide is plainly visible, but the light due to calcium sulphide and other phosphorescent substances is quiet and continuous.

The foregoing explanation of this phenomenon was made by Frank L. Hess of the U. S. Geological Survey.

## BEGINNING OF LABOR SHORTAGE IN COAL FIELDS SHOWN BY STATISTICS

In 1915 There Was a Decided Increase in Amount of Coal Mined, But the Number of Workingmen Decreased—Number of Active Days Also Shows Increase—Mines Operate Average of 203 Days

Statistics of coal production in 1915 recently compiled by the Geological Survey show that the bituminous coal mines of the United States were operated for an average of 203 days in 1915, and that they employed 557,456 men. Similar data for Pennsylvania also are given in the table included in the statement.

The Survey also has made an estimate of bituminous coal production during the first six months of 1916. No estimate of the output in separate states in the same period has been made, however, and no data are available covering the number of men employed or the number of days they worked during the first half of the present year. Such data will not be available until the reports of the year's operations are received by the Survey after the close of the calendar year.

The survey's report on coal in 1915 contains data with regard to the men employed, days worked, and the average output, in tons, per man per day and per year. These statistics will show the relation between the number of employees and the annual output. The average annual output per employee is, perhaps, the best index of the labor supply, and depends upon the daily rate and upon the number of active days. As shown the daily rate has exhibited a steady upward tendency, but as it is not possible to change this rate greatly within any short period, record outputs are obtained by increasing the number of men and by working the mines a greater number of days. The average number of men engaged in mining bituminous coal has, with a few slight exceptions, shown increase in each succeeding year from 1900 to 1914, and the average number of days the men worked has varied up or down with the increase or decrease in the total production. The record of 1915, however, presents a striking exception to the general tendency, for although there was (compared with 1914) an increase in the total output, accompanied by a greater number of active days, the number of employees decreased notably. When considered in connection with the statistics of previous years, this decrease is seen to be abnormal and indicates the beginning at least of a labor shortage.

As stated in the mid-year review there is every reason to believe that the output of coal in 1916 will exceed the previous records,

and the final figures (when available) covering the days operated and men employed, will undoubtedly show a large increase in the average number of days, with possibly no very great difference in the number of men employed, although with regard to this the Survey has not precise information. It will be noted that approximately 557,000 men produced more than 442,000,000 tons of bituminous coal in 203 days, in 1915, or about 2,180,000 tons per day. The same number of men working at the same rate would have worked 120 days to produce the 261,000,000 tons of coal which it has been estimated were mined during the first six months of 1916. If the rate of production in the last half of 1916 is the same as in the first half, more than 520,000,000 tons of coal will have been produced, and if the same number of men are engaged in this production as were employed in 1915, they will have worked but 240 days out of the 365 days in the year. This figure does not appear high, when compared with 234 days in 1907, and 232 days in 1913, in the bituminous fields, or with 246 days in 1911, 257 in 1912, or 243 in 1914, in the anthracite region. In fact, some of the individual states show even higher records. For instance, in 1913 the bituminous mines in Pennsylvania operated on an average of 267 days; those of Virginia, 280 days, and those of Alabama, 255 days.

### COAL AN IMPORTANT BAROMETER OF BUSINESS

Aside from its use as domestic fuel, coal enters indirectly into the industrial life of the nation. Mechanical power and heat are fundamental necessities of industry, and coal is the principal source of heat and power. It is, therefore, to be expected that any tendency either of progress or retrogression, in business, will be reflected in the production of coal. Attention to this point is called by C. E. Lesher, Coal Statistician of the Geological Survey.

### Marquardt Returns From China

The staff of the petroleum division of the associated geological engineers has recently been augmented by engaging Ernest Marquardt for service in Oklahoma. Mr. Marquardt has lately returned from China, where he was attached to the geological staff of F. G. Clapp. He remained in China after the return home of the latter a year ago.

## CAR SUPPLY HAD DISTINCT EFFECT ON COAL INDUSTRY DURING 1915

**With Market Always Ready to Absorb Their Product Oil and Gas Miners Enjoy Advantage Over Producers of Bituminous Coal. Their Success Depends on Finding Market for Their Output**

Coal production in January, 1915, was the highest for any month of the first half of the year. February, a short month, recorded a marked decrease, and March, usually a good month, did not show much improvement. The low point for the year was reached in April, and from that time on each succeeding month recorded increases. The influence of the car shortage was plainly shown for November and December during which period the previous rate of increase was not maintained. These facts are established by returns to the United States Geological Survey.

"Shortages and surpluses of cars may occur simultaneously on different parts of the same railroad, and are to be expected at the same time on different roads throughout the country in all classes of freight equipment," said C. E. Lesher of the Survey in explaining the car shortage problem. "When the surplus is at its maximum any shortage that may be shown is small and extremely local in character. Such a condition represents a period of very slack railroad business and consequent dull times in nearly all lines of industry. A small surplus of freight equipment is indicative of heavy transportation movement and prosperous times and is usually attended by a shortage the magnitude of which depends, of course, upon the ability of the railroads to keep the surplus cars moving toward the points of shortage. Any set of circumstances that ties up a large number of cars and prevents their prompt unloading and return to service, reduces the surplus and tends to aggravate the shortage. All these conditions were met in 1915 and had a distinct effect upon the coal industry."

### AS TO LABOR

In speaking of other features of the coal industry Mr. Lesher makes the following comment:

"The bituminous coal reserves of the United States are immense and the area under development and the necessary mechanical equipment available—the productive capacity, in other words—have kept pace with any demand that has yet developed. In this important respect the coal industry differs from that of the allied but competitive fuels, petroleum and natural gas. With the potential supply of the country as a whole always greater than the demand, the rate of coal production, a fluctuating quantity, depends upon conditions and circumstances outside the coal fields. Two factors, however, labor and car supply, constitute exceptions to this generalization. With regard to the possibility of inadequate labor supply, it is to be noted that in 1913, the year of maximum recorded coal

production, the bituminous miners worked but an average of 232 days out of a possible 250 to 275. On the other hand, the proved reserves of petroleum and natural gas are more restricted and the available marketable supply is limited by the number of productive wells in existence at any time. Supply and demand alternate as ruling factors, and as new wells are essential to maintain or increase output, a demand in excess of supply is corrected by drilling activity inspired by rising prices. Drilling an oil well and opening a coal mine are both gambling ventures, differing, however, in that in one success depends upon finding oil or gas, and in the other, in finding a market for the output."

### BUREAU OF MINES TO REPRINT SOME POPULAR PUBLICATIONS

Owing to the very insistent demand for certain publications of the Bureau of Mines reprints have been authorized of the following publications: Bulletins 67, 70 and 100 and technical papers 80 and 89, and all miners' circulars.

It is contrary to the policy of the Bureau of Mines to reprint publications for free distribution. After the original supply for free distribution is exhausted, those desiring them are referred to the Superintendent of Documents where the publication is sold at cost.

It has been judged advisable to vary from this general rule in the case of the publications mentioned, as it is to the interest of the public that they be circulated as widely as possible.

Bulletins 67 and 100 deal with certain features of the making of iron and steel. Technical paper 80 has been very popular. It is entitled "Hand Firing Soft Coal Under Power Plant Boilers." It describes the best method of firing soft coal and handling fires and discusses the loss in power generation. The bulletin tells how coal may be fired to prevent smoke. The smoke inspector for the city of Washington declares that this bulletin has done more to keep Washington clean than any of the other numerous efforts made in that direction. Decided improvements have been made in such smoky cities as Pittsburgh, Chicago and Cleveland, as a result of the general distribution of this bulletin among firemen.

Technical paper 89 is entitled "Coal Tar Products and the Possibility of Increasing Their Manufacture in the United States." This paper discusses a question of such vital interest at the present time as to make it one of the most sought after of all the publications of the Bureau.

## NEEDS OF TIMES DEMAND GENERAL SUPPORT FOR NATIONAL ASSOCIATION

### Local Organizations of Mine Operators Have Big Task in Meeting Needs in Own Sections But Extra Effort Must Be Made, Many Believe, in Order To Make Possible Additional Work in Washington

Here is a problem which is to be discussed at the coming convention of the American Mining Congress:

Associations of miners, not national in scope, think they have sufficient to do if they care properly for the local and state matters which require their attention. Many urge, however, that there is national work which should be done by these associations and which they could not effectively do by themselves, and if left undone, would be a severe handicap upon their operations.

The trend of the public today is for the centralization of power in the Federal Government. Mining men, as a rule, greatly regret the power of this movement, and believe that the day will come when public thought will reverse itself upon many of these questions, but the fact remains that the Federal Government is assuming increasing authority.

Ten years ago the Colorado labor trouble of last year would have been purely a Colorado matter. Last year it was the subject of four Federal investigations; one by the Commission on Industrial Relations; one by a Congressional Committee, and two by two separate Commissions appointed by the President of the United States for that purpose.

The local associations cannot, if they would, ignore these conditions in times of trouble, and many think it wise that they should put themselves in cooperation with others having a vital interest, to the end that Federal legislative handicaps shall not be fastened upon them when entering a race for justice in competition with others whose loads have been lightened and whose interests have been protected by class legislation.

No State can secure for itself such a uniformity in mining laws, and must, to accomplish this, act in cooperation with other States to the end that the best judgment of all shall agree upon the general principles which should be applied, subject to such variations as are necessary to meet local conditions.

An unjust workmen's compensation law in any other State, which may become a precedent for a similar injustice in another State, is a matter in which a lack of interest will bring its penalties.

An unjust Blue-Sky law which effectively prohibits the raising of money for the development of western mining enterprises is a handicap to some States, while upon the other hand the activities of consciousless promoters who bring disgrace upon mining by methods which all

condemn, cannot be prevented locally, but should be reached in a conservative way by a great cooperative movement including all branches of the mining industry.

### NATIVE SILVER FOUND IN ROCHESTER MINE

Information from Rochester, Nev., is that important developments are taking place.

The mills are all in full operation and a high percentage of extraction is being obtained from the ores. The Rochester Mines mill is being enlarged to nearly double its present capacity. The bottom of the Codd winze at the 800-foot point is all in ore which is better than milling grade and contains very rich specimens of native silver which seem to indicate concentration by descending surface waters.

In the Cerbat range of the Mohave County, Arizona, several of the larger mines are actively producing chiefly zinc-lead ores.

In the Chloride District the Tennessee mine has just opened up on the 1,400-ft. level a large body of ore averaging 50 per cent in lead and zinc. In the Midnight mine, recently purchased by Salt Lake parties for \$250,000, the average zinc content of the lode, which is 40 feet in width on the 200-ft. level, is 15 per cent.

In the Cerbat District the Golconda mine has just encountered commercial ore on the 1,100-ft. level and is erecting a 200-ton oil flotation plant for treatment of zinc ores.

In the Tom Reed-Gold Road District, which for more than a year is the center of attraction in the southwest, there is a steady increase in the volume of mining. With a capitalization of more than \$53,000,000 operations are being actively prosecuted by 125 separately organized mining corporations and the activity seems to be warranted by substantial results of nearly all deep development. More than 2,200 miners are actually employed in the district. More than \$25,000 a day is being expended for wages and equipment. The boundaries of the district are being gradually extended by new discoveries.

## Personals

M. R. Campbell and David White have added a 375-page volume to the contributions to Economic Geology of the United States Geological Survey. The work covers petroleum, natural gas and coal. It contains numerous illustrations and charts.

Judge C. B. Foote, of Kansas City, and J. H. Hoffman, of Los Angeles, who are interested in mining in Mohave County, Ariz., were in Washington recently.

Prof. B. L. Miller of Lehigh University at Bethlehem, Pa. was in Washington recently. A series of articles by Prof. Miller and Prof. J. T. Singerwald of Johns Hopkins University, Baltimore, is now appearing in the technical press.

Chas. E. Dutton, of Goldfield, Nev., paid a visit to New York and Boston on business recently.

F. J. Bailey, chief clerk of the Bureau of Mines, will attend the fifth business men's military camp at Plattsburg. W. W. Adams of the Bureau of Mines was a member of the fourth camp.

Homer P. Darlington of the Pennsylvania Salt Manufacturing Co., whose headquarters are at Natrona, Pa., passed through Washington recently on his way back from pyrites investigations in several southern States.

H. M. Griggs, general coal and ore agent of the New York Central lines, and Attorney Bronson, of the same company, were in Washington recently. They are interested in the West Virginia-Ohio rate case which is before the Interstate Commerce Commission.

A zincograph section showing the bituminous coal beds in West Virginia just has been completed by the Geological Survey of that state.

"Geology of the Foraker Quadrangle of Osage County, Oklahoma," is the subject of a bulletin just issued by the Geological Survey. It was written by K. C. Heald.

W. A. Williams, petroleum technologist of the Bureau of Mines, is on the Pacific coast supervising the work being done under the direction of the Bureau of Mines.

Dr. I. C. White of Morgantown, W. Va., has been appointed consulting geologist of the Baltimore & Ohio Railroad.

Sidney Paige, recently put in charge of the Western Areal Geology for the Geological Survey, is visiting field parties in the West.

## WAR BOOSTS PRICE OF CHILE SALTPETER

The chemical difference between sodium and potassium nitrate is in the character of the basic metal. As indicated in the names of these compounds, the metal in the one is sodium and in the other, potassium. Sodium nitrate, or Chile saltpeter, is imported into this country in large quantity from Chile. The potassium or potash nitrate has come chiefly from Germany, which controls the world's potash supply. It is practically impossible to obtain potash salts of any kind at the present time and quotations on potassium nitrate (niter) have not been published for a long time. Owing to the great demand for Chile saltpeter the price of this commodity has greatly increased and it is now bringing approximately \$3.00 per 100 pounds.

## IN MARKET FOR MORE GIBBS RESCUE APPARATUSES

The Bureau of Mines has asked for bids on twenty-five Gibbs Rescue Apparatuses. Plans and specifications also have gone to manufacturers with the idea of ascertaining the cost of manufacturing the Burrell gas detector.

## Map Plattsburg Area

George Otis Smith, director of the Geological Survey, visited Plattsburg, N.Y., in July to familiarize himself with the progress being made on the military map of that vicinity which is being made under his direction for the use of the War Department.

## Justify Rate Increase on Coal

In Investigation and Suspension Docket No. 755 the proposed increased rates on bituminous coal in carloads from mines in Illinois and Indiana to points in Illinois, Indiana, Wisconsin, and Michigan found justified, and orders of suspension vacated.

F. G. Clapp and M. L. Fuller, managing engineers of The Associated Geological Engineers, have been investigating properties in Kansas. The latter has returned East, while the former has gone to Duncan, Okla.

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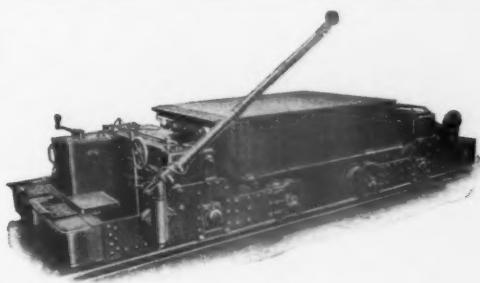
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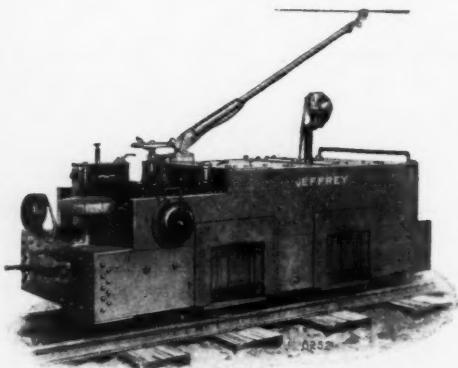
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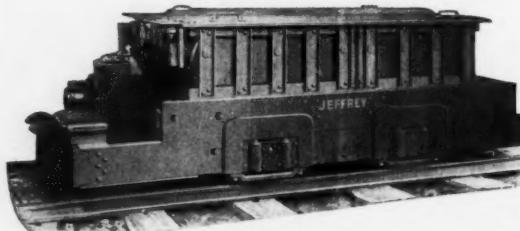
Mine Cars and Trucks—Gravity Screening Equipments—Larry Wagons  
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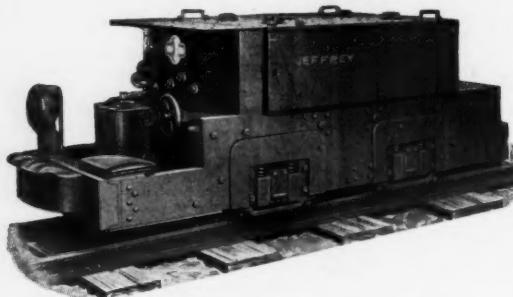
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